

**AIR QUALITY AND METEOROLOGICAL
NETWORK AT MIDNITE MINE
SUPERFUND SITE,
STEVENS COUNTY, WA**

**QUARTERLY MONITORING REPORT NO. 10
FOURTH QUARTER 2018**

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**MIDNITE MINE SUPERFUND SITE
AMBIENT AIR QUALITY / METEOROLOGY
QUARTERLY MONITORING REPORT NO. 10:
OCTOBER 1 THROUGH NOVEMBER 2, 2018**

1.0 INTRODUCTION

As specified in the Midnite Mine Superfund Site (site) Dust Control and Air Quality Monitoring Plan, Revision 1 (DCAQMP; Bison Engineering, January 2016), an ambient air quality / meteorology monitoring report will be submitted within 45 days after the end of each calendar quarter. This report is being submitted for the monitoring performed during the fourth quarter of 2018 from October 1 through November 2, 2018. Construction activities were suspended for the winter on November 2.

During the week of May 17-20, 2016, a meteorological station and an ambient particulate (TSP) monitoring network were installed at Midnite Mine (site) by Bison Engineering, Inc. The meteorological station began collecting data on May 20, 2016 while the TSP network was activated in conjunction with site grading and remediation activities on May 23, 2016. The purpose of the air monitoring network is to provide an additional measure of protection from potential airborne contaminants for the downwind community and the public in general. The network is not intended for use in establishing compliance with ambient standards, nor as a substitute for any required health and safety monitoring. The pre-set air quality thresholds have been established and are presented in the DCAQMP. The network monitors air quality and provides an alert to the remediation team in the event that air quality thresholds are exceeded. Alerts will trigger investigation and if the alert is found to be the result of elevated airborne dust concentration, the application of further dust control measures can be implemented as appropriate. Routine (i.e., daily) operation of the monitoring network is performed by the Construction Quality Control (CQC) contractor (Stantec), while data reporting and quality assurance is performed by Bison Engineering.

2.0 MONITORING NETWORK DESCRIPTION

The network includes the components described in the following paragraphs.

Fixed TSP Monitoring Sites: Three Met One E-Sampler® continuous monitors for the measurement of total suspended particulates (TSP) are located around the perimeter of the site, as shown in Figure 1. They were sited to measure TSP concentrations near the Mine Area fenceline, with the objective of alerting site personnel to potential off-site exposure to airborne dust. The samplers were located such that at least one location would typically be upwind, and one downwind, from any construction activities at the site. Additional rationale for locations of the fixed monitors is provided in the DCAQMP. The locations of the fixed TSP monitors are described in the weekly Construction Quality Control (CQC) reports.

Roving TSP Monitoring Sites: In addition to the fixed monitoring locations, as many as three roving TSP monitors may be deployed to monitor impacts from remediation activities, such as excavation, grading, and stockpiling of excavated soils. In general, the monitors are installed within 50 to 100 yards immediately downwind from the areas disturbed by construction / remediation activities, with the objective of monitoring maximum concentrations to which on-site workers may be exposed. The locations of the roving TSP monitors are described in the weekly Construction Quality Control (CQC) reports.

Meteorological Monitoring Site: A fixed 10-foot meteorological tower presently is located near the center of the site in a relatively level area exposed to the prevailing winds. Originally it was located near the site's southwestern boundary; the tower was moved on June 27, 2018, because of impending earthwork at the original site. Both locations are shown in Figure 1. Measurements include wind direction and speed, temperature, relative humidity, solar radiation and precipitation. The meteorological data is used to help determine whether any elevated particulate episodes are directly related to the site construction / remediation activities, or whether they are associated with off-site sources such as wildfire smoke and agricultural activities. Additionally, the meteorological data are used to help identify false elevated TSP readings caused by fog.

During Bison's last site visit on November 20, 2018, the meteorological station was temporarily moved to a location near the lower decontamination building to provide easy access over the winter. This will enable site personnel to keep its solar panels free of snow over the winter without traveling over possibly difficult roads. Additionally, the rain gauge heater was connected to nearby AC power to provide accurate precipitation data over the winter months when much of the site precipitation falls as snow. The meteorological station will be moved to its normal location at the start of the 2019 construction season.

Data Communication and Alarming System: A critical feature of the monitoring network is the data communication and alarming system, which alerts on-site personnel to elevated levels of airborne particulates. Data from all TSP samplers and from the

meteorological station are continuously transmitted to a base station located on-site at the decontamination station. Whenever an alarm occurs, the real-time meteorological data and site conditions are investigated to determine whether the elevated particulate levels are associated with site activities or another source (e.g., wildfire smoke/local prescribed burns, fog or other weather related event). The particulate alarm levels were calculated to address concerns that site remediation activities could result in airborne emissions of potentially hazardous concentrations of contaminants of concern (COCs) as described in the DCAQMP. After determining that manganese had the most restrictive TSP threshold concentration ($3854 \mu\text{g}/\text{m}^3$), that value was divided by 10 to provide an additional safety factor resulting in a trigger value of $385 \mu\text{g}/\text{m}^3$. Because the historical 24-hour TSP standard (which was superseded by PM_{10} and $\text{PM}_{2.5}$ standards) had been $260 \mu\text{g}/\text{m}^3$, the trigger/alarm value for the site was further reduced to that value. The DCAQMP presents a detailed discussion of the historical sampling data and rationale used to establish the TSP trigger level.

Analysis of Exposed TSP Filters for Particulate Mass: The E-Sampler measurement is essentially an optical method which correlates the visual opacity of the sampled air to the airborne particulate concentration within that air. The relationship (which is site-specific) must be determined empirically by collecting particulate matter on a filter during sampling and comparing 1) the average TSP concentration calculated from the particulate mass, and 2) the average TSP concentration reported by the E-Sampler. The ratio of those averages is then entered into the E-Sampler's software to adjust its measurements going forward.

Based on Bison's previous experience, the E-Samplers were initially deployed with an assumed calibration factor of 3.00. A filter test was initiated at the start of sampling in May 2016 to empirically determine appropriate calibration factors. Results were used to adjust the E-Samplers' calibration coefficients on August 31, 2016, as discussed in Section 3.0.

New Fixed E-Sampler Designations: When the TSP monitors were calibrated and deployed at the start of the 2018 construction season, it was discovered that the radios normally used at the North Boundary and Southeast Boundary locations (No. 1 and No. 2, respectively) had failed over the winter. Therefore radio No. 4 was deployed at the North Boundary site and Radio No. 8 at the Southeast Boundary site, as depicted in Figure 1. Replacement radios (designated as No. 1 and No. 2) were obtained and tested and are now available for use. Site personnel have elected to keep radios No. 4 and No. 8 at their current locations for the remainder of the 2018 season to minimize confusion.

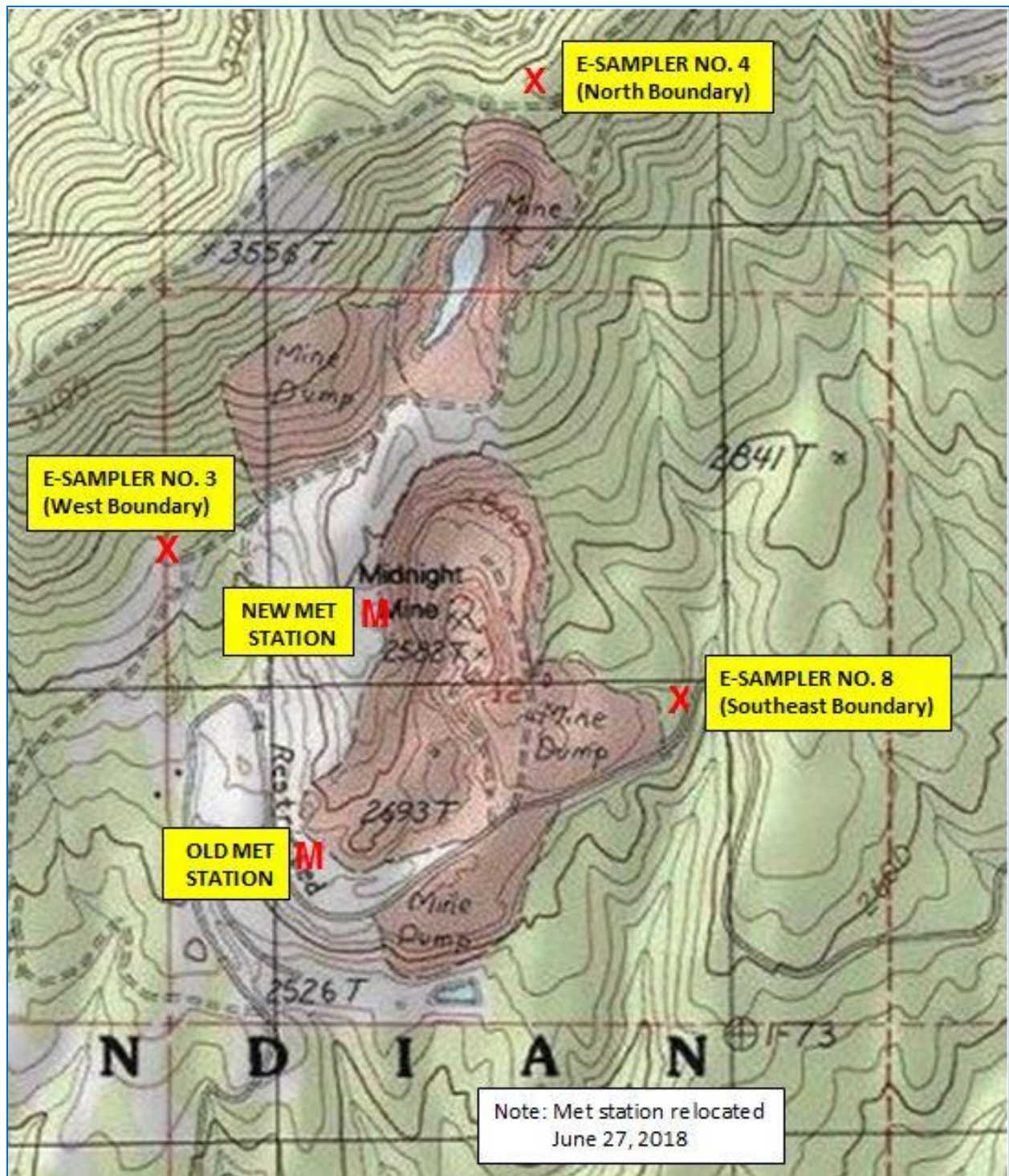


Figure 1: Overview of Fixed TSP / Meteorological Monitors in 2018

3.0 SUMMARY OF CURRENT MONITORING ACTIVITIES

During the fourth quarter of 2018, continuous TSP monitoring was performed at the three fixed sites during all work hours. Work hours were 0600 to 0300 (on the following day) local time because the site was working double shifts. Additional TSP monitoring was performed by as many as three roving samplers during those same periods. The roving samplers were relocated whenever work locations moved to make sure that potential emissions specific to ongoing remediation activities were reliably monitored. In general the monitors remained within 50 -100 yards of active work areas as described in the daily and weekly CQA reports.

Clean Teflon filters were installed in the samplers at the start of monitoring (May 20, 2016) and were removed on June 21 and June 22, 2016. The exposed filters were submitted for gravimetric analysis of total particulate, and the results were used to calculate empirical TSP correction factors for the three fixed perimeter samplers and the five roving samplers. That analysis was presented in a separate topical report (***Determination of Calibration Factors for E-Sampler Particulate Monitors at the Midnite Mine Superfund Site***) issued in August 2016. On August 31, 2016 an empirical correction factor of 4.92 was programmed into the three fixed samplers, while a factor of 8.05 was programmed into the five roving samplers. Those calibration factors were used throughout the fourth quarter of 2018.

Appendix A presents a summary of monitoring dates and locations for each of the eight E-Samplers.

4.0 SUMMARY OF HOURLY DATA FOR CURRENT PERIOD

A listing of hourly monitoring data for the fourth quarter is presented in Appendix B. As noted in the introduction, remediation activities were formally suspended for the winter on November 2. However, the last TSP monitoring was performed on October 29 because rain and fog on the night of October 28-29 created wet conditions that precluded remediation work on October 29. Frequent rain, fog and wet conditions continued through November 2, and no TSP monitoring was performed during that period.

Table 1 summarizes the average and maximum one-hour TSP readings reported by the operating E-Samplers in the fourth quarter of 2018. The statistics are limited to valid data periods when on-site TSP concentrations were representative of local conditions, and exclude the following:

- On the evening of October 2, a regional dust event occurred due to passage of a strong cold front. While winds at the Midnite Mine were fairly light due to its protected location, the Spokane airport reported steady winds of 20 to 30 mph for several hours, along with blowing dust. All four of the operating E-Samplers reported their highest valid hourly concentrations of the fourth quarter at 1900 PST: 316 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 3, 307 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 4, 487 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 5 and 237 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 8. While valid, those values were not incorporated into the Table 1 statistics because they reflected a short-term, regional dust event unrelated to site activity. The four-hour period affected by this event is shaded gray in Appendix B. During this event, water was added to Stockpile 4 as a precaution.
- On the night of October 25-26 and on the morning of October 29, false high TSP readings were observed due to fog. Those values were excluded from statistical analysis and are shaded blue in Appendix B.

The highest quarterly average TSP concentration of 43 $\mu\text{g}/\text{m}^3$ occurred at E-Sampler No. 5 (deployed just north of Stockpile 4) and at E-Sampler No. 6 (located northeast of Pit 4). The other monitors had average TSP concentrations ranging from 23 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 3 (located at the west boundary) to 36 $\mu\text{g}/\text{m}^3$ at E-Sampler No. 7 (located at the Hillside Waste Rock Pile).

Table 1 also shows the wind speed, wind direction, monitoring location and time of occurrence for each E-Sampler maximum hourly reading. Note that this analysis is based on valid TSP data measured over **block** hours (e.g., between 1001 and 1100 PST). All six samplers reported their maximum concentrations on October 24. Winds were generally light and variable, indicating possible stagnant conditions.

The Spokane airport data indicate that temperatures in October were near normal. Precipitation for October was approximately 125 percent of normal, although the month was mostly dry until the last week.

Table 1: TSP Data Statistics for Quarter 4, 2018^{1,2}

Monitor ID	Avg. TSP (µg/m³)	Max. Hourly TSP (µg/m³)	Date and Time	Location	WS/WD
ES-1 ³	N/A	N/A	N/A	N/A	N/A
ES-2 ³	N/A	N/A	N/A	N/A	N/A
ES-3 (fixed)	23	103	10/24 0600 PST	MMSS West Boundary	0.4 mph 358°
ES-4 (fixed)	25	140	10/24 0200 PST	MMSS North Boundary	0.3 mph 181°
ES-5	43	179	10/24 1000 PST	N of Stockpile 4	4.8 mph 90°
ES-6	43	204	10/24 0200 PST	NE of Pit 4	0.3 mph 181°
ES-7	36	167	10/24 0100 PST 10/24 0200 PST	Hillside Waste Rock Pile	1.8 mph 309° 0.3 mph 181°
ES-8 (fixed)	25	108	10/24 0100 PST	MMSS Southeast Boundary	1.8 mph 309°
¹ Excludes false high-TSP periods caused by fog, and TSP data during a regional dust event on October 2. See discussion in Section 4.0. ² No sampling performed after October 29 due to wet conditions ³ Sampler not used during month					

5.0 ALARM EVENTS

The Midnite Mine data collection system provides automated e-mail alarm notifications to specified project team members whenever the rolling one-hour TSP concentration at any monitor exceeds the 260 $\mu\text{g}/\text{m}^3$ trigger level. The system also sends out notifications whenever the rolling 15-minute TSP concentration exceeds 260 $\mu\text{g}/\text{m}^3$; this gives onsite personnel advance notification that a TSP problem may be developing so they can take appropriate actions (e.g., additional watering) to prevent an actual alarm condition. The methodology for determining alarm conditions is discussed in greater detail at the end of this section.

A total of 11 alarm episodes occurred during the fourth quarter of 2018. Three of these alarms were valid, in that they reflected elevated TSP levels. However, they were associated with a regional dust event (discussed in Section 4.0), and not site construction activity. The other 8 alarm episodes were triggered by false elevated TSP concentrations caused by rain and/or fog.

Table 2 presents data for each alarm episode during the fourth quarter based on the alarm event data file. It shows the start and end times and reported particulate concentrations associated with each alarm episode. The table also indicates whether the episode was valid and whether it was caused or enhanced by external factors (e.g., regional dust events, fog or precipitation). Note that the start and end times represent the first and last times at which the rolling one-hour TSP average exceeded the 260 $\mu\text{g}/\text{m}^3$ trigger level.

The 11 alarms listed in Table 2 can be summarized as follows:

- Three of the alarms occurred on October 2 when site activities were in progress but were associated with a regional dust event as confirmed by Spokane airport weather observations.
- The remaining eight alarms were caused by false elevated TSP readings during rain and fog events. During four of the false alarms no site activities were in progress.
- No specific responses were required for these alarms since they were not related to site activities. However, normal dust control methods were consistently employed during site operations in accordance with requirements set forth in the DCAQMP. During the October 2 alarm event, additional water was applied to Stockpile 4 as a precaution.

All reported TSP alarms were documented in the weekly reports for the appropriate time periods. Appendix C presents documentation of alarm events occurring during the fourth quarter of 2018.

Alarm Condition Methodology

An alarm condition exists whenever the rolling one-hour TSP average at any monitor exceeds the 260 $\mu\text{g}/\text{m}^3$ trigger level. The rolling one-hour TSP value is calculated by averaging the twelve preceding 5-minute TSP block averages. Thus a new rolling one-hour TSP average is calculated for each monitor every five minutes. Whenever this rolling average exceeds 260 $\mu\text{g}/\text{m}^3$ a record is automatically written to the site datalogger's alarm event data file and the e-mail alarm notification process is initiated.

For example, consider the reported alarm condition at E-Sampler No. 5 on October 2, 2018:

- The alarm episode time interval was 1805-1924 PST.
 - The alarm condition first occurred at 1805 PST on October 2, because the rolling one-hour TSP average based on the twelve 5-minute blocks representing 1706 through 1805 PST exceeded 260 $\mu\text{g}/\text{m}^3$.
 - The alarm condition lasted through 1924 PST because the 60-minute rolling TSP average remained above 260 $\mu\text{g}/\text{m}^3$ through that time. The alarm condition cleared at 1925 PST because the new 60-minute calculated rolling average (based on 1826 through 1925 PST) dropped below 260 $\mu\text{g}/\text{m}^3$.
- The average of the rolling one-hour TSP concentrations over the entire alarm episode was 444 $\mu\text{g}/\text{m}^3$.
- The maximum rolling one-hour TSP concentration within the alarm episode was 560 $\mu\text{g}/\text{m}^3$ and occurred at 1845 PST (based on the twelve 5-minute blocks representing 1746 PST through 1845 PST).
- The rightmost column indicates this was a valid alarm, but was caused by a regional dust event and not site activities.

Table 2: Summary of Reported Alarm Events, Quarter 4, 2018

Sampler	Date (2018) and Time Interval (PST)	Sampler Location	Average^A TSP Alarm Value (µg/m³)	Maximum^B TSP Alarm Value (µg/m³)	Time of Maximum TSP Alarm Value (µg/m³)	Valid Alarm?
ES-4	10/02 @ 1825-1914	MMSS North Boundary	302	327	1850	Yes ¹
	10/25 @ 2310 – 10/26 @ 0514	MMSS North Boundary	479	880	0345	No ²
	10/28 @ 0435-0634	MMSS North Boundary	799	1,174	0525	No ^{2,3}
	10/28 @ 0715-1159	MMSS North Boundary	948	1,430	0945	No ^{2,3}
	10/29 @ 0620-0839	MMSS North Boundary	812	1,185	0750	No ²
ES-5	10/02 @ 1805-1924	N of Stockpile 4	444	560	1845	Yes ¹
ES-6	10/26 @ 0300-0439	NE of Pit 4	564	830	0350	No ^{2,3}
	10/28 @ 0520-1159	NE of Pit 4	1,706	4,161	0950	No ^{2,3}
	10/29 @ 0700-0844	NE of Pit 4	1,130	1,940	0750	No ²
ES-8	10/02 @ 1850-1854	MMSS Southeast Boundary	261	261	1850	Yes ¹
	10/29 @ 0915-0934	MMSS Southeast Boundary	273	280	0920	No ²
^A Denotes average TSP value over entire alarm episode. ^B Denotes maximum one-hour rolling average TSP value over entire alarm episode. ¹ Elevated TSP readings caused by regional dust event, not site activities. ² False elevated TSP readings caused by rain and/or fog, not site activities. ³ No site activity at time of alarm.						

6.0 WIND ROSE ANALYSIS

Figure 2 presents a wind rose for the site for the fourth quarter of 2018, based on hourly wind data collected by the 10-foot meteorological tower during the October 1 – November 2 construction period addressed by this report. Table 3 shows the same data in tabular format. The meteorological station was located near the center of the site as shown in Figure 1.

During the fourth quarter winds were predominantly from the southwest and northwest quadrants and from the north-northeast, accounting for approximately 80 percent of observed winds. Winds from the north-northeast and from southerly directions tended to be the strongest. However, wind speeds at the site were generally light, averaging only 2.4 miles per hour (mph). The highest measured one-hour average wind speed was 12.2 mph. The light winds are due to the local terrain; much of the site is sheltered by higher ridges to the east and west, and is extensively forested. The new meteorological site is less exposed than the former site; the average wind speed at the former site was generally around 4 mph, versus 3 mph or less at the new site. The meteorological station was moved on June 27 due to impending construction activity at the previous site.

Monthly wind roses for October and November are presented in Appendix D. The November wind rose has an exaggerated directional distribution because the statistics were based on only the first 2 days of the month (site operations were suspended for the winter on November 2). Conversely the October wind rose is nearly identical to the quarterly wind rose, because October comprised 31 of the 33 days included in the quarterly wind rose. Average monthly wind speeds were 2.4 mph in both October and November.

Figure 2: Wind Rose for Dawn / Newmont Midnite Mine Site, Washington

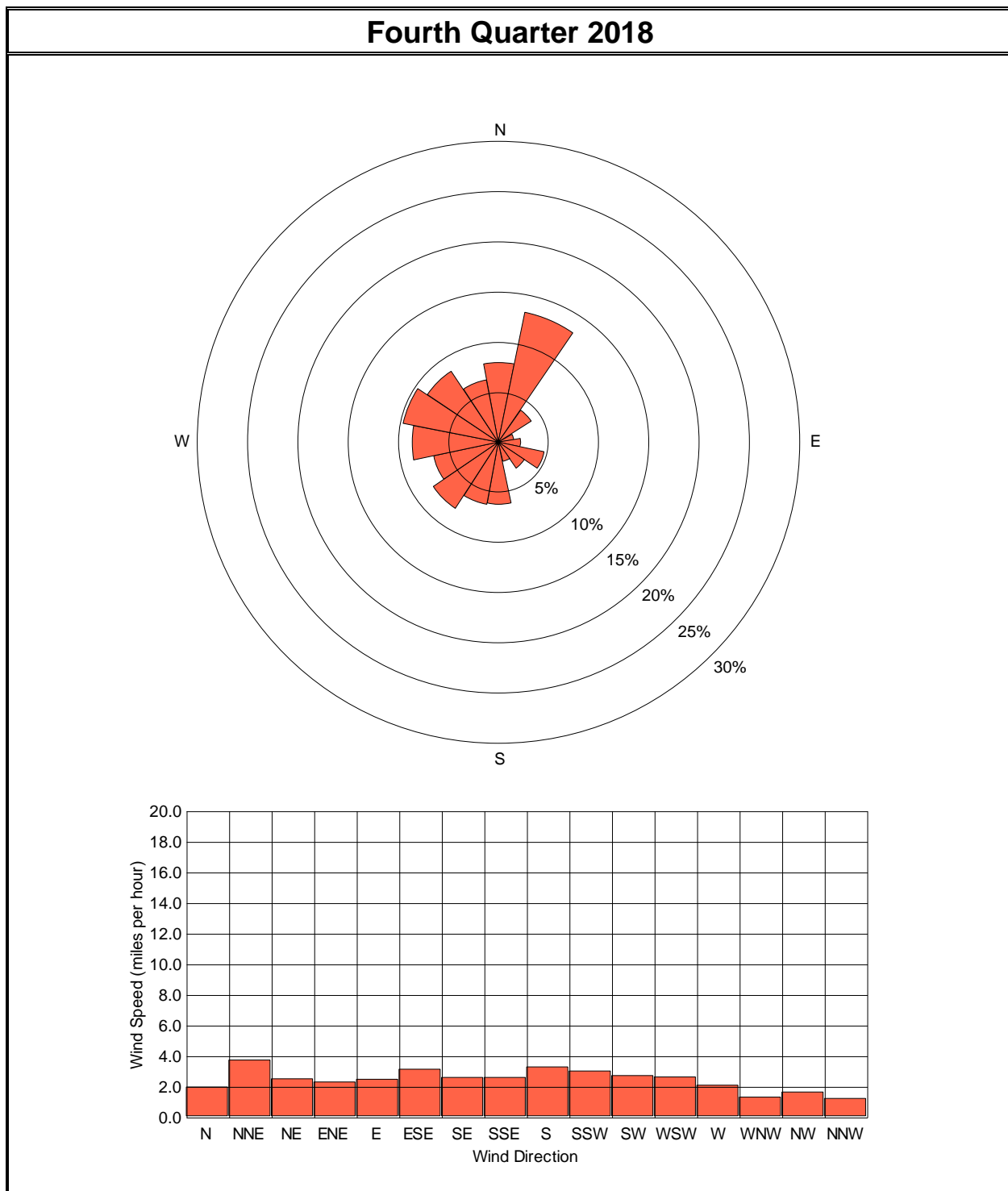


Table 3: Wind Rose Summary for Dawn / Newmont Midnite Mine Site, Washington

Fourth Quarter 2018																	
Direction>>>	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (miles per hour)	0.1 - 2.0	5.2	3.5	1.9	0.6	1.1	1.4	1.1	0.6	1.8	1.1	2.4	2.9	5.3	8.3	6.3	48.7
	2.1 - 4.0	1.4	5.3	1.6	0.9	0.8	2.1	1.6	1.3	2.5	4.3	4.5	1.9	2.3	1.3	1.8	34.7
	4.1 - 6.0	1.1	2.0	0.3	0.1	0.4	1.1	0.4	0.1	1.4	0.8	0.6	1.5	0.6	0.0	0.1	10.7
	6.1 - 8.0	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.3	0.3	0.3	0.0	0.3	2.8
	8.1 - 10.0	0.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	1.1
	10.1 - 12.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
	12.1 - 14.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	14.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20.1 - 22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22.1 - 24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	24.1 - 26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	26.1 - 28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28.1 - 30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	30.1 - 32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	32.1 - 34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	34.1 - 36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	36.1 - 38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38.1 - 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calm																	1.4
Total	8.0	13.1	3.9	1.6	2.3	4.7	3.2	2.0	6.2	6.3	7.8	6.6	8.6	9.6	8.5	6.3	100.0
Average Speed	2.0	3.7	2.5	2.3	2.5	3.2	2.6	2.6	3.3	3.0	2.7	2.6	2.1	1.3	1.6	1.2	2.4

7.0 HOURLY DATA TABLES

Appendix B presents the hourly data values for all operating E-Samplers and for the meteorological parameters during those periods when remediation activities were occurring. Note that all data is reported based on Pacific Standard Time (PST), not daylight savings time which was in effect throughout the fourth quarter site operations.

Data codes used in the tables include:

ND	No data reported during the hour (sampler not operating)
D	Elevated TSP levels caused by regional dust event
F	False elevated TSP readings caused by fog

- All valid E-Sampler readings at or above the 260 $\mu\text{g}/\text{m}^3$ trigger level are shown in bold red font.
- Periods when TSP readings were affected by a regional dust event are shaded in gray.
- Periods when TSP readings were affected by fog are shaded in blue.

8.0 EQUIPMENT CALIBRATION DATA

The E-Samplers were removed from the site by Bison on November 20. Their calibrations were checked at Bison's Helena office on December 17. The E-Sampler calibration results are presented in Appendix E.

Meteorological calibrations were performed on-site on November 20 and are presented in Appendix F. The meteorological station was subsequently moved to a location adjacent to the lower decontamination building adjacent to the office trailers, to provide easier access over the winter. It will be returned to its normal location when construction operations resume in 2019.

9.0 EPA METHOD 9 AND METHOD 22 TESTING

No Method 9 or Method 22 evaluations were conducted during the fourth quarter of 2018. All work performed during the fourth quarter was in limited, distinct locations that could be adequately monitored by the E-Samplers. Additionally, no large stationary sources were operated during the quarter (such as the crusher that was operated during much of the 2017 construction season).

APPENDIX A: E-SAMPLER MONITORING LOCATIONS QUARTER 4, 2018

Location tables are grouped by calendar week.

- The site operated on double shifts throughout the fourth quarter. During that time a “Workday” is defined as starting at 0600 PDT and ending by 0200 PDT. For example, the Workday of October 1 begins at 0600 PDT on October 1 and ends at 0200 PDT on October 2.

TSP Monitoring Locations from October 1 – October 5, 2018

Monitor ID	Location Description	Starting Workday	Ending Workday
ES-1	NOT USED	N/A	N/A
ES-2	NOT USED	N/A	N/A
ES-3 (fixed)	Midnite Mine West Boundary	10/01/2018	10/05/2018
ES-4 (fixed)	Midnite Mine North Boundary	10/01/2018	10/05/2018
ES-5	N of Stockpile 4	10/01/2018	10/05/2018
ES-6	NE of Pit 4	10/01/2018	10/04/2018
ES-7	Hillside Waste Rock Pile	10/01/2018 10/03/2018	10/01/2018 10/05/2018
ES-8 (fixed)	Midnite Mine Southeast Boundary	10/01/2018	10/05/2018

TSP Monitoring Locations from October 8 – October 12, 2018

Monitor ID	Location Description	Starting Workday	Ending Workday
ES-1	NOT USED	N/A	N/A
ES-2	NOT USED	N/A	N/A
ES-3 (fixed)	Midnite Mine West Boundary	10/08/2018	10/12/2018
ES-4 (fixed)	Midnite Mine North Boundary	10/08/2018	10/12/2018
ES-5	N of Stockpile 4	10/11/2018	10/12/2018
ES-6	NE of Pit 4	10/10/2018	10/12/2018
ES-7	Hillside Waste Rock Pile	10/10/2018	10/12/2018
ES-8 (fixed)	Midnite Mine Southeast Boundary	10/08/2018	10/12/2018

TSP Monitoring Locations from October 15 – October 19, 2018

Monitor ID	Location Description	Starting Workday	Ending Workday
ES-1	NOT USED	N/A	N/A
ES-2	NOT USED	N/A	N/A
ES-3 (fixed)	Midnite Mine West Boundary	10/15/2018	10/19/2018
ES-4 (fixed)	Midnite Mine North Boundary	10/15/2018	10/19/2018
ES-5	N of Stockpile 4	10/15/2018	10/19/2018
ES-6	NE of Pit 4	10/15/2018	10/19/2018
ES-7	Hillside Waste Rock Pile	10/15/2018	10/19/2018
ES-8 (fixed)	Midnite Mine Southeast Boundary	10/15/2018	10/19/2018

TSP Monitoring Locations from October 22 – October 26, 2018

Monitor ID	Location Description	Starting Workday	Ending Workday
ES-1	NOT USED	N/A	N/A
ES-2	NOT USED	N/A	N/A
ES-3 (fixed)	Midnite Mine West Boundary	10/22/2018	10/26/2018
ES-4 (fixed)	Midnite Mine North Boundary	10/22/2018	10/26/2018
ES-5	N of Stockpile 4	10/22/2018	10/26/2018
ES-6	NE of Pit 4	10/22/2018	10/26/2018
ES-7	Hillside Waste Rock Pile	10/22/2018	10/25/2018
ES-8 (fixed)	Midnite Mine Southeast Boundary	10/22/2018	10/26/2018

TSP Monitoring Locations from October 29 – November 2, 2018¹

Monitor ID	Location Description	Starting Workday	Ending Workday
ES-1	NOT USED	N/A	N/A
ES-2	NOT USED	N/A	N/A
ES-3 (fixed)	Midnite Mine West Boundary	10/29/2018	10/29/2018
ES-4 (fixed)	Midnite Mine North Boundary	10/29/2018	10/29/2018
ES-5	N of Stockpile 4	N/A	N/A
ES-6	NE of Pit 4	10/29/2018	10/29/2018
ES-7	Hillside Waste Rock Pile	N/A	N/A
ES-8 (fixed)	Midnite Mine Southeast Boundary	10/29/2018	10/29/2018
¹ Samplers shut down on morning of October 29 due to rain and fog. Site activity limited after October 29 due to wet conditions. All activity stopped for winter shutdown beginning November 2.			

APPENDIX B: HOURLY TSP / MET DATA
QUARTER 4, 2018

The following tables present the hourly data values for all operating E-Samplers and for the meteorological parameters during those periods when remediation activities were occurring. Note that all data is reported based on Pacific Standard Time (PST), not daylight savings time which was in effect throughout the fourth quarter.

Data codes used in the tables include:

- | | |
|----|--|
| ND | No data reported during the hour (sampler not operating) |
| D | Elevated TSP levels caused by regional dust event |
| F | False elevated TSP readings caused by fog |

- All valid E-Sampler readings at or above the 260 $\mu\text{g}/\text{m}^3$ trigger level are shown in bold red font.
- Periods when TSP readings were affected by a regional dust event are shaded in gray.
- Periods when TSP readings were affected by fog are shaded in blue.

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m³)								HOURLY METEOROLOGICAL DATA VALUES						
									WD					DAILY	
	WS	WD	Sigma	TEMP	RH	SOLAR	PCP								
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m²	inches
10/1/2018 1:00	ND	ND	27	28	ND	ND	44	29	3.3	12	35	46.8	66.8	0	0.00
10/1/2018 2:00	ND	ND	23	24	ND	ND	34	25	3.6	16	26	46.8	66.9	0	0.00
10/1/2018 6:00	ND	ND	19	22	21	22	43	19	1.4	346	62	48.1	63.3	0	0.00
10/1/2018 7:00	ND	ND	26	25	23	35	5	17	2.3	41	61	48.2	62.9	20	0.00
10/1/2018 8:00	ND	ND	25	20	31	26	ND	19	3.2	44	54	49.7	60.7	128	0.00
10/1/2018 9:00	ND	ND	23	19	33	27	ND	20	3.8	102	49	52.0	56.9	210	0.00
10/1/2018 10:00	ND	ND	22	21	34	28	ND	20	4.1	129	47	56.2	49.9	499	0.00
10/1/2018 11:00	ND	ND	22	25	38	31	ND	22	4.5	172	42	58.7	45.3	540	0.00
10/1/2018 12:00	ND	ND	26	30	52	48	ND	27	4.7	190	25	59.2	45.8	312	0.00
10/1/2018 13:00	ND	ND	21	30	41	49	ND	23	4.8	210	33	61.8	44.4	433	0.00
10/1/2018 14:00	ND	ND	19	30	43	52	ND	25	5.8	189	43	64.1	40.2	370	0.00
10/1/2018 15:00	ND	ND	18	27	46	49	ND	22	5.4	185	61	63.9	41.5	277	0.00
10/1/2018 16:00	ND	ND	24	25	43	38	ND	23	4.3	255	55	63.6	44.1	243	0.00
10/1/2018 17:00	ND	ND	22	24	49	35	ND	22	2.2	245	63	62.1	46.7	74	0.00
10/1/2018 18:00	ND	ND	16	26	37	38	ND	18	1.3	191	72	59.3	50.5	4	0.00
10/1/2018 19:00	ND	ND	14	25	42	45	ND	19	1.8	175	74	58.4	52.4	0	0.00
10/1/2018 20:00	ND	ND	19	24	43	41	ND	22	2.5	234	68	58.5	52.2	0	0.00
10/1/2018 21:00	ND	ND	21	28	44	46	ND	25	2.6	214	52	58.4	53.2	0	0.00
10/1/2018 22:00	ND	ND	17	22	34	34	ND	22	2.2	285	45	56.2	62.2	0	0.00
10/1/2018 23:00	ND	ND	19	22	36	33	ND	21	2.4	329	81	54.8	68.2	0	0.00
10/2/2018 0:00	ND	ND	18	24	40	36	ND	21	0.9	224	48	55.1	64.1	0	0.00
10/2/2018 1:00	ND	ND	19	24	37	35	ND	21	1.1	209	34	54.9	63.8	0	0.00
10/2/2018 2:00	ND	ND	20	25	39	36	ND	24	1.1	228	44	53.9	66.6	0	0.00
10/2/2018 6:00	ND	ND	21	22	38	29	ND	21	1.2	274	73	50.8	76.0	1	0.00
10/2/2018 7:00	ND	ND	19	26	40	37	ND	24	2.3	247	47	50.4	78.2	27	0.00
10/2/2018 8:00	ND	ND	19	23	35	33	ND	22	2.1	229	61	51.2	77.6	112	0.00
10/2/2018 9:00	ND	ND	17	19	32	30	ND	19	3.5	222	31	55.1	70.1	290	0.00
10/2/2018 10:00	ND	ND	8	15	25	22	ND	12	5.0	198	37	58.9	60.1	483	0.00
10/2/2018 11:00	ND	ND	6	12	18	18	ND	9	6.1	190	38	60.6	53.5	333	0.00
10/2/2018 12:00	ND	ND	10	16	28	32	ND	12	6.6	185	36	60.4	53.6	223	0.00
10/2/2018 13:00	ND	ND	13	24	38	45	ND	15	6.7	190	45	60.9	51.8	325	0.00
10/2/2018 14:00	ND	ND	12	21	35	37	ND	17	5.7	203	58	60.4	51.1	191	0.00
10/2/2018 15:00	ND	ND	11	21	43	48	ND	16	6.3	222	62	61.8	42.2	269	0.00
10/2/2018 16:00	ND	ND	18	20	44	47	ND	20	5.8	234	67	62.6	36.0	224	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/2/2018 17:00	ND	ND	55 D	57 D	131 D	90 D	ND	69 D	7.0	269	36	60.2	31.4	91	0.00
10/2/2018 18:00	ND	ND	100 D	108 D	235 D	119 D	ND	106 D	7.0	268	46	55.1	36.5	4	0.00
10/2/2018 19:00	ND	ND	316 D	307 D	487 D	ND	ND	237 D	5.8	258	31	50.9	43.8	0	0.00
10/2/2018 20:00	ND	ND	42 D	44 D	63 D	ND	ND	40 D	7.4	237	81	45.5	59.5	0	0.00
10/2/2018 21:00	ND	ND	3	3	6	ND	ND	4	6.5	193	44	42.8	65.5	0	0.00
10/2/2018 22:00	ND	ND	3	2	3	ND	ND	2	4.0	201	66	41.4	68.9	0	0.00
10/2/2018 23:00	ND	ND	2	2	4	ND	ND	4	7.3	243	16	40.1	67.8	0	0.00
10/3/2018 0:00	ND	ND	2	7	8	ND	ND	8	9.3	264	22	40.1	59.5	0	0.00
10/3/2018 1:00	ND	ND	5	9	13	ND	ND	6	7.2	178	59	38.3	57.0	0	0.00
10/3/2018 2:00	ND	ND	4	4	11	ND	ND	7	7.5	308	28	36.4	60.9	0	0.00
10/3/2018 6:00	ND	ND	4	3	15	43	1	3	5.3	353	43	36.3	61.2	1	0.00
10/3/2018 7:00	ND	ND	2	4	10	4	1	5	2.7	296	70	36.7	61.1	72	0.00
10/3/2018 8:00	ND	ND	3	4	6	6	3	5	2.3	197	32	40.2	55.6	218	0.00
10/3/2018 9:00	ND	ND	3	7	15	7	7	2	2.8	164	55	42.2	52.8	371	0.00
10/3/2018 10:00	ND	ND	5	5	10	6	8	5	5.8	110	42	44.7	52.0	488	0.00
10/3/2018 11:00	ND	ND	5	4	10	6	5	5	4.0	130	77	46.1	50.2	385	0.00
10/3/2018 12:00	ND	ND	6	5	13	10	8	5	3.8	153	76	45.6	51.1	327	0.00
10/3/2018 13:00	ND	ND	6	5	15	10	8	4	4.8	94	61	47.5	47.7	450	0.00
10/3/2018 14:00	ND	ND	5	15	11	12	11	5	4.6	115	55	48.4	45.2	358	0.00
10/3/2018 15:00	ND	ND	5	5	16	8	9	5	4.6	127	48	49.6	41.6	372	0.00
10/3/2018 16:00	ND	ND	4	3	10	8	7	6	3.6	121	54	49.6	39.9	214	0.00
10/3/2018 17:00	ND	ND	4	5	12	8	6	5	2.6	17	38	48.4	41.9	52	0.00
10/3/2018 18:00	ND	ND	3	6	13	12	6	5	3.2	21	47	47.0	42.9	6	0.00
10/3/2018 19:00	ND	ND	7	7	11	8	10	7	3.7	16	24	45.9	41.6	0	0.00
10/3/2018 20:00	ND	ND	6	7	11	10	8	7	3.7	25	16	46.5	41.1	0	0.00
10/3/2018 21:00	ND	ND	5	7	12	12	11	8	3.1	27	21	46.8	43.4	0	0.00
10/3/2018 22:00	ND	ND	6	6	12	8	11	7	2.1	24	38	46.5	45.7	0	0.00
10/3/2018 23:00	ND	ND	5	6	10	7	8	5	2.0	40	42	45.9	49.2	0	0.00
10/4/2018 0:00	ND	ND	5	6	11	5	9	6	1.2	293	51	45.3	50.7	0	0.00
10/4/2018 1:00	ND	ND	6	7	14	4	9	7	1.1	294	55	44.5	52.9	0	0.00
10/4/2018 2:00	ND	ND	3	5	14	4	7	9	1.4	283	16	43.9	55.7	0	0.00
10/4/2018 6:00	ND	ND	4	6	12	7	9	5	0.0	341	11	40.2	63.7	0	0.00
10/4/2018 7:00	ND	ND	7	11	16	1	11	8	0.4	281	11	40.3	64.2	21	0.00
10/4/2018 8:00	ND	ND	9	14	33	ND	15	9	0.3	146	12	40.9	66.6	87	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m³)								HOURLY METEOROLOGICAL DATA VALUES						DAILY PCP inches
									WS	WD	Sigma	TEMP	RH	SOLAR	
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m²	
10/4/2018 9:00	ND	ND	7	13	15	ND	16	7	1.2	198	46	46.0	58.2	289	0.00
10/4/2018 10:00	ND	ND	7	13	17	15	15	9	3.3	191	36	47.2	56.6	329	0.00
10/4/2018 11:00	ND	ND	9	12	18	21	15	9	4.6	209	32	49.7	50.5	502	0.00
10/4/2018 12:00	ND	ND	9	15	33	30	17	10	4.5	240	46	51.2	44.3	450	0.00
10/4/2018 13:00	ND	ND	11	15	26	21	19	13	4.1	208	43	52.2	43.8	473	0.00
10/4/2018 14:00	ND	ND	11	13	23	24	19	14	4.3	227	52	54.1	40.8	497	0.00
10/4/2018 15:00	ND	ND	10	15	26	25	17	13	4.0	227	46	55.4	37.0	407	0.00
10/4/2018 16:00	ND	ND	11	12	19	19	17	13	3.6	234	53	56.3	33.7	287	0.00
10/4/2018 17:00	ND	ND	9	11	27	19	12	11	2.7	264	56	54.6	35.2	88	0.00
10/4/2018 18:00	ND	ND	10	12	34	20	16	14	1.2	311	18	51.7	39.8	4	0.00
10/4/2018 19:00	ND	ND	11	13	27	21	16	13	1.4	306	21	51.0	40.7	0	0.00
10/4/2018 20:00	ND	ND	11	10	24	21	16	13	1.5	311	18	49.2	43.1	0	0.00
10/4/2018 21:00	ND	ND	12	13	24	ND	14	12	3.1	322	17	47.5	48.3	0	0.00
10/4/2018 22:00	ND	ND	21	22	44	ND	31	20	1.3	335	43	46.3	53.5	0	0.00
10/4/2018 23:00	ND	ND	19	22	36	ND	31	24	3.4	310	23	46.0	53.7	0	0.00
10/5/2018 0:00	ND	ND	16	20	38	ND	27	23	1.5	333	46	45.7	53.5	0	0.00
10/5/2018 1:00	ND	ND	16	19	34	ND	24	22	0.7	278	53	44.3	56.2	0	0.00
10/5/2018 2:00	ND	ND	15	27	45	ND	42	23	0.7	359	60	44.9	51.7	0	0.00
10/5/2018 6:00	ND	ND	16	16	31	ND	24	17	2.1	353	45	38.7	67.5	1	0.00
10/5/2018 7:00	ND	ND	19	25	31	ND	35	15	2.0	3	83	40.4	63.1	37	0.00
10/5/2018 8:00	ND	ND	19	21	34	ND	30	21	4.2	112	22	42.3	61.0	213	0.00
10/5/2018 9:00	ND	ND	22	24	40	ND	36	23	3.4	99	46	43.7	61.2	241	0.00
10/5/2018 10:00	ND	ND	24	24	42	ND	34	25	3.5	122	33	44.8	60.2	292	0.00
10/5/2018 11:00	ND	ND	24	22	42	ND	34	23	3.6	103	48	45.0	60.0	273	0.00
10/5/2018 12:00	ND	ND	30	26	49	ND	38	27	3.4	92	67	47.4	56.8	308	0.00
10/5/2018 13:00	ND	ND	28	27	46	ND	33	27	3.4	109	45	49.4	53.8	319	0.00
10/5/2018 14:00	ND	ND	30	27	42	ND	36	25	4.6	120	43	50.7	51.0	305	0.00
10/5/2018 15:00	ND	ND	19	22	41	ND	31	20	4.7	149	29	51.3	48.6	183	0.00
10/5/2018 16:00	ND	ND	17	18	33	ND	21	22	4.0	175	24	51.2	48.3	73	0.00
10/5/2018 17:00	ND	ND	20	25	38	ND	30	24	4.1	186	19	50.2	51.3	26	0.00
10/5/2018 18:00	ND	ND	24	29	47	ND	35	28	3.4	185	21	47.8	58.6	2	0.00
10/5/2018 19:00	ND	ND	20	25	40	ND	34	25	1.9	175	29	45.0	72.4	0	0.01
10/5/2018 20:00	ND	ND	11	12	24	ND	14	15	0.5	275	71	42.8	85.8	0	0.02
10/5/2018 21:00	ND	ND	8	8	17	ND	9	10	1.0	38	71	42.2	86.2	0	0.04
10/5/2018 22:00	ND	ND	9	9	16	ND	14	10	0.1	265	36	42.0	89.1	0	0.06

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/5/2018 23:00	ND	ND	9	10	16	ND	14	10	1.1	353	47	41.6	89.5	0	0.07
10/6/2018 0:00	ND	ND	10	11	17	ND	12	10	2.1	353	43	40.7	91.8	0	0.07
10/6/2018 1:00	ND	ND	9	12	20	ND	15	10	2.7	23	31	40.4	92.8	0	0.01
10/6/2018 2:00	ND	ND	10	12	20	ND	16	10	4.1	19	11	40.6	87.6	0	0.03
10/8/2018 6:00	ND	ND	42	48	ND	ND	ND	40	1.9	57	44	43.5	89.9	0	0.03
10/8/2018 7:00	ND	ND	36	40	ND	ND	ND	35	3.9	31	30	44.0	86.2	6	0.03
10/8/2018 8:00	ND	ND	27	30	ND	ND	ND	32	2.9	56	66	44.4	84.0	23	0.03
10/8/2018 9:00	ND	ND	30	23	ND	ND	ND	35	2.1	74	81	44.0	88.0	58	0.03
10/8/2018 10:00	ND	ND	19	20	ND	ND	ND	20	5.3	18	20	44.6	82.4	91	0.03
10/8/2018 11:00	ND	ND	16	14	ND	ND	ND	16	3.8	90	49	46.5	75.1	176	0.03
10/8/2018 12:00	ND	ND	14	14	ND	ND	ND	15	3.4	105	47	47.1	76.3	158	0.03
10/8/2018 13:00	ND	ND	14	14	ND	ND	ND	15	1.5	118	71	47.0	80.4	124	0.04
10/8/2018 14:00	ND	ND	14	13	ND	ND	ND	13	1.0	80	62	47.5	77.7	163	0.05
10/8/2018 15:00	ND	ND	10	12	ND	ND	ND	10	0.8	19	51	48.1	68.5	122	0.05
10/8/2018 16:00	ND	ND	11	11	ND	ND	ND	11	0.8	342	64	47.2	73.2	50	0.05
10/8/2018 17:00	ND	ND	11	13	ND	ND	ND	12	1.2	352	22	45.5	82.5	14	0.06
10/8/2018 18:00	ND	ND	17	13	ND	ND	ND	13	1.9	349	33	44.6	81.4	1	0.08
10/8/2018 19:00	ND	ND	12	12	ND	ND	ND	14	2.8	14	19	43.4	86.6	0	0.11
10/8/2018 20:00	ND	ND	12	12	ND	ND	ND	14	4.1	20	8	43.0	87.8	0	0.12
10/8/2018 21:00	ND	ND	14	13	ND	ND	ND	13	3.6	13	19	42.6	89.9	0	0.12
10/8/2018 22:00	ND	ND	12	12	ND	ND	ND	12	3.9	18	22	42.3	90.1	0	0.13
10/8/2018 23:00	ND	ND	11	13	ND	ND	ND	12	3.6	18	24	41.8	92.4	0	0.14
10/9/2018 0:00	ND	ND	12	12	ND	ND	ND	12	4.1	17	9	41.8	92.3	0	0.17
10/9/2018 1:00	ND	ND	14	13	ND	ND	ND	12	3.7	21	22	41.5	94.3	0	0.03
10/9/2018 2:00	ND	ND	11	19	ND	ND	ND	11	3.7	15	26	41.3	95.3	0	0.09
10/9/2018 6:00	ND	ND	6	4	ND	ND	ND	6	8.2	16	16	40.2	87.4	0	0.18
10/9/2018 7:00	ND	ND	4	3	ND	ND	ND	4	9.6	17	4	40.7	83.5	6	0.18
10/9/2018 8:00	ND	ND	3	4	ND	ND	ND	3	9.9	18	5	42.2	80.2	53	0.18
10/9/2018 9:00	ND	ND	4	3	ND	ND	ND	5	12.2	14	7	43.5	76.1	157	0.18
10/9/2018 10:00	ND	ND	5	4	ND	ND	ND	7	11.6	13	9	46.1	69.4	433	0.18
10/9/2018 11:00	ND	ND	5	7	ND	ND	ND	6	10.3	15	16	46.8	64.4	285	0.18
10/9/2018 12:00	ND	ND	5	6	ND	ND	ND	7	7.4	14	33	49.9	60.2	570	0.18
10/9/2018 13:00	ND	ND	7	5	ND	ND	ND	7	8.8	19	34	50.5	57.6	419	0.18
10/9/2018 14:00	ND	ND	4	4	ND	ND	ND	3	8.4	27	34	50.7	52.4	403	0.18

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m³)								HOURLY METEOROLOGICAL DATA VALUES						DAILY PCP inches
									WS	WD	Sigma	TEMP	RH	SOLAR	
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m²	
10/9/2018 15:00	ND	ND	4	4	ND	ND	ND	4	6.6	27	26	51.3	49.0	214	0.18
10/9/2018 16:00	ND	ND	2	3	ND	ND	ND	3	4.9	19	37	51.4	46.5	88	0.18
10/9/2018 17:00	ND	ND	2	2	ND	ND	ND	2	4.4	16	19	51.0	45.3	26	0.18
10/9/2018 18:00	ND	ND	2	3	ND	ND	ND	2	4.3	15	11	50.8	43.9	1	0.18
10/9/2018 19:00	ND	ND	2	3	ND	ND	ND	3	5.0	8	24	50.7	43.0	0	0.18
10/9/2018 20:00	ND	ND	3	3	ND	ND	ND	2	5.8	9	22	49.8	43.7	0	0.18
10/9/2018 21:00	ND	ND	6	3	ND	ND	ND	2	7.2	11	21	48.4	44.2	0	0.18
10/9/2018 22:00	ND	ND	4	3	ND	ND	ND	1	6.1	13	28	47.8	43.5	0	0.18
10/9/2018 23:00	ND	ND	2	4	ND	ND	ND	3	5.1	11	32	46.4	45.5	0	0.18
10/10/2018 0:00	ND	ND	2	3	ND	ND	ND	3	5.2	17	13	45.3	46.3	0	0.18
10/10/2018 1:00	ND	ND	1	2	ND	ND	ND	5	4.7	16	15	45.2	45.8	0	0.00
10/10/2018 2:00	ND	ND	2	2	ND	ND	ND	2	5.6	16	4	45.7	45.2	0	0.00
10/10/2018 6:00	ND	ND	2	2	ND	ND	ND	2	2.8	18	23	42.9	49.2	0	0.00
10/10/2018 7:00	ND	ND	1	1	ND	ND	ND	2	2.2	23	21	43.1	49.8	21	0.00
10/10/2018 8:00	ND	ND	5	2	ND	ND	ND	4	2.5	18	62	44.8	47.8	90	0.00
10/10/2018 9:00	ND	ND	3	3	ND	ND	ND	4	3.4	30	49	46.0	46.4	217	0.00
10/10/2018 10:00	ND	ND	6	1	ND	ND	2	3	5.6	78	63	48.7	41.3	446	0.00
10/10/2018 11:00	ND	ND	3	2	ND	4	7	3	4.6	104	52	51.2	38.8	541	0.00
10/10/2018 12:00	ND	ND	2	2	ND	3	3	2	4.0	154	71	52.8	40.6	573	0.00
10/10/2018 13:00	ND	ND	4	5	ND	11	5	5	4.1	213	54	53.3	41.3	547	0.00
10/10/2018 14:00	ND	ND	2	2	ND	4	7	4	3.5	258	75	54.3	38.2	492	0.00
10/10/2018 15:00	ND	ND	3	3	ND	5	5	2	3.2	137	82	55.7	35.0	398	0.00
10/10/2018 16:00	ND	ND	4	2	ND	3	4	4	3.6	47	63	55.8	32.9	243	0.00
10/10/2018 17:00	ND	ND	4	2	ND	4	4	3	3.4	110	39	53.2	36.1	61	0.00
10/10/2018 18:00	ND	ND	1	3	ND	6	5	1	0.5	343	60	48.8	43.9	2	0.00
10/10/2018 19:00	ND	ND	2	2	ND	4	3	2	1.3	303	47	48.2	44.5	0	0.00
10/10/2018 20:00	ND	ND	2	2	ND	5	3	3	0.1	334	17	46.8	46.9	0	0.00
10/10/2018 21:00	ND	ND	4	3	ND	5	1	3	0.1	339	7	46.7	48.2	0	0.00
10/10/2018 22:00	ND	ND	3	4	ND	6	3	3	1.1	301	7	46.1	50.3	0	0.00
10/10/2018 23:00	ND	ND	2	3	ND	5	4	2	1.6	297	13	46.3	48.3	0	0.00
10/11/2018 0:00	ND	ND	3	3	ND	7	3	4	0.9	322	10	45.8	49.9	0	0.00
10/11/2018 1:00	ND	ND	4	3	ND	5	5	4	0.1	342	4	42.9	55.7	0	0.00
10/11/2018 2:00	ND	ND	4	4	ND	8	4	3	0.2	350	6	42.3	56.6	0	0.00
10/11/2018 6:00	ND	ND	3	5	7	6	8	5	1.1	26	33	40.6	61.9	0	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/11/2018 7:00	ND	ND	8	7	16	10	10	8	0.4	6	11	42.3	62.3	43	0.00
10/11/2018 8:00	ND	ND	7	13	14	19	8	7	1.1	213	28	45.9	55.5	182	0.00
10/11/2018 9:00	ND	ND	6	14	11	17	9	6	1.1	207	37	48.1	52.2	330	0.00
10/11/2018 10:00	ND	ND	8	12	14	18	15	10	3.1	211	29	47.3	56.4	448	0.00
10/11/2018 11:00	ND	ND	12	12	24	20	16	14	3.9	216	21	49.4	54.6	537	0.00
10/11/2018 12:00	ND	ND	13	14	24	23	19	15	3.8	227	45	50.8	51.3	472	0.00
10/11/2018 13:00	ND	ND	12	19	24	30	18	13	4.4	247	44	52.1	50.2	432	0.00
10/11/2018 14:00	ND	ND	12	21	22	40	17	13	4.4	280	54	52.7	49.1	372	0.00
10/11/2018 15:00	ND	ND	13	21	25	25	20	15	4.2	255	55	54.7	45.4	382	0.00
10/11/2018 16:00	ND	ND	12	14	24	21	17	16	3.5	266	38	54.3	45.3	154	0.00
10/11/2018 17:00	ND	ND	13	17	31	26	19	15	2.4	266	42	51.9	51.4	32	0.00
10/11/2018 18:00	ND	ND	15	17	33	34	19	17	1.8	291	46	50.5	55.4	2	0.00
10/11/2018 19:00	ND	ND	13	16	33	34	21	17	2.8	321	8	49.2	57.7	0	0.00
10/11/2018 20:00	ND	ND	13	16	33	34	23	17	1.8	290	41	47.8	60.7	0	0.00
10/11/2018 21:00	ND	ND	14	20	37	36	23	18	1.3	327	38	46.6	63.8	0	0.00
10/11/2018 22:00	ND	ND	16	23	34	37	29	20	0.7	345	45	45.2	68.3	0	0.00
10/11/2018 23:00	ND	ND	17	25	40	43	32	21	1.4	294	19	44.7	70.6	0	0.00
10/12/2018 0:00	ND	ND	18	27	45	48	36	24	0.6	302	11	44.2	72.5	0	0.00
10/12/2018 1:00	ND	ND	17	24	48	42	35	25	1.4	315	13	44.5	72.0	0	0.00
10/12/2018 2:00	ND	ND	16	24	44	36	30	22	0.3	294	40	43.6	72.2	0	0.00
10/12/2018 6:00	ND	ND	25	30	53	50	39	32	1.5	256	44	43.1	70.9	0	0.00
10/12/2018 7:00	ND	ND	21	32	51	44	36	25	1.5	222	28	42.3	73.3	28	0.00
10/12/2018 8:00	ND	ND	22	27	42	40	30	21	1.4	232	67	46.4	64.3	175	0.00
10/12/2018 9:00	ND	ND	21	27	40	43	34	20	2.9	158	57	48.1	61.2	320	0.00
10/12/2018 10:00	ND	ND	22	31	39	49	35	24	3.3	167	40	50.0	58.5	443	0.00
10/12/2018 11:00	ND	ND	24	28	40	39	34	24	4.0	173	33	52.3	55.4	525	0.00
10/12/2018 12:00	ND	ND	15	25	35	36	27	19	3.7	198	47	55.5	49.7	558	0.00
10/12/2018 13:00	ND	ND	15	18	26	29	22	15	3.9	185	37	57.2	46.7	527	0.00
10/12/2018 14:00	ND	ND	11	15	21	24	19	16	4.2	175	48	58.1	45.5	465	0.00
10/12/2018 15:00	ND	ND	9	12	19	26	14	14	3.8	222	36	60.0	42.7	358	0.00
10/12/2018 16:00	ND	ND	11	10	21	16	15	14	2.9	224	37	60.5	42.4	218	0.00
10/12/2018 17:00	ND	ND	9	13	23	22	17	11	1.5	256	44	58.2	46.4	54	0.00
10/12/2018 18:00	ND	ND	7	12	18	19	16	14	2.1	324	11	54.3	52.9	2	0.00
10/12/2018 19:00	ND	ND	11	13	20	22	17	13	2.3	309	13	53.6	54.5	0	0.00
10/12/2018 20:00	ND	ND	11	15	24	26	22	17	6.3	232	59	53.4	55.3	0	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m ³)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	WS	WD	Sigma	TEMP	RH	SOLAR	PCP								
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m ²	inches
10/12/2018 21:00	ND	ND	15	13	33	21	29	13	8.8	46	83	51.7	44.0	0	0.00
10/12/2018 22:00	ND	ND	6	8	12	12	15	5	6.3	353	52	51.4	36.4	0	0.00
10/12/2018 23:00	ND	ND	5	6	8	13	8	5	6.4	322	78	50.1	35.7	0	0.00
10/13/2018 0:00	ND	ND	4	10	14	16	16	4	5.1	170	69	48.3	39.4	0	0.00
10/13/2018 1:00	ND	ND	4	5	7	9	6	4	4.4	182	74	47.0	42.6	0	0.00
10/13/2018 2:00	ND	ND	4	4	8	9	4	11	4.1	246	66	45.6	46.1	0	0.00
10/15/2018 6:00	ND	ND	17	16	ND	21	ND	16	0.3	339	33	37.8	63.9	0	0.00
10/15/2018 7:00	ND	ND	19	20	18	30	24	17	0.3	32	49	38.5	61.8	34	0.00
10/15/2018 8:00	ND	ND	19	17	25	27	26	15	1.6	104	57	43.8	49.3	163	0.00
10/15/2018 9:00	ND	ND	14	13	21	18	16	12	3.0	135	21	45.7	47.3	303	0.00
10/15/2018 10:00	ND	ND	11	13	15	17	15	11	3.0	157	27	48.2	43.6	423	0.00
10/15/2018 11:00	ND	ND	10	9	16	14	14	12	3.3	173	37	50.1	40.7	504	0.00
10/15/2018 12:00	ND	ND	10	11	20	16	15	11	3.4	191	39	51.4	37.8	541	0.00
10/15/2018 13:00	ND	ND	10	11	20	14	16	10	3.3	195	55	54.1	35.2	518	0.00
10/15/2018 14:00	ND	ND	8	12	20	17	13	9	3.2	182	40	55.9	33.1	450	0.00
10/15/2018 15:00	ND	ND	8	10	18	17	11	9	3.5	218	39	57.3	31.6	341	0.00
10/15/2018 16:00	ND	ND	9	9	15	16	13	10	2.9	217	34	58.3	30.6	199	0.00
10/15/2018 17:00	ND	ND	8	9	21	17	10	10	1.4	243	50	55.7	34.1	40	0.00
10/15/2018 18:00	ND	ND	6	11	24	12	11	13	1.6	320	16	52.1	37.8	1	0.00
10/15/2018 19:00	ND	ND	8	11	25	17	15	14	2.1	319	17	51.5	37.7	0	0.00
10/15/2018 20:00	ND	ND	9	11	22	18	16	14	1.9	299	35	50.2	39.8	0	0.00
10/15/2018 21:00	ND	ND	9	12	21	19	14	10	1.4	289	28	48.5	42.7	0	0.00
10/15/2018 22:00	ND	ND	10	11	20	18	15	15	0.6	345	51	48.5	42.9	0	0.00
10/15/2018 23:00	ND	ND	11	12	22	16	15	10	1.0	319	50	46.8	46.9	0	0.00
10/16/2018 0:00	ND	ND	11	13	26	17	15	14	0.8	306	29	46.1	47.9	0	0.00
10/16/2018 1:00	ND	ND	11	11	26	17	11	15	Calm	Calm	Calm	44.3	50.4	0	0.00
10/16/2018 2:00	ND	ND	10	12	24	16	14	10	0.5	359	27	43.8	51.4	0	0.00
10/16/2018 6:00	ND	ND	15	14	33	23	23	16	2.1	69	48	42.8	53.6	0	0.00
10/16/2018 7:00	ND	ND	16	14	35	25	25	20	1.7	89	39	43.5	52.4	30	0.00
10/16/2018 8:00	ND	ND	23	19	38	28	28	18	0.7	133	38	47.5	49.5	162	0.00
10/16/2018 9:00	ND	ND	19	20	36	32	28	18	1.6	121	29	49.9	47.9	305	0.00
10/16/2018 10:00	ND	ND	20	22	33	31	26	19	2.1	177	67	51.4	46.6	424	0.00
10/16/2018 11:00	ND	ND	24	26	43	38	36	28	2.8	225	34	53.4	44.2	505	0.00
10/16/2018 12:00	ND	ND	25	28	50	43	40	31	3.0	194	47	55.9	41.4	537	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/16/2018 13:00	ND	ND	26	30	51	44	41	32	3.2	225	42	56.7	40.4	518	0.00
10/16/2018 14:00	ND	ND	28	31	48	45	35	29	3.5	200	33	57.7	38.8	447	0.00
10/16/2018 15:00	ND	ND	27	28	46	41	35	31	3.3	186	39	59.1	36.7	338	0.00
10/16/2018 16:00	ND	ND	28	28	50	38	39	31	2.8	216	26	59.6	35.9	197	0.00
10/16/2018 17:00	ND	ND	28	30	52	41	39	30	0.7	222	38	57.0	39.5	39	0.00
10/16/2018 18:00	ND	ND	29	32	57	47	40	30	0.4	302	19	52.3	47.1	1	0.00
10/16/2018 19:00	ND	ND	25	32	57	42	38	31	0.1	315	9	51.7	46.9	0	0.00
10/16/2018 20:00	ND	ND	26	28	54	40	34	31	0.2	337	4	51.4	47.2	0	0.00
10/16/2018 21:00	ND	ND	30	33	53	47	44	26	0.5	347	14	51.6	44.0	0	0.00
10/16/2018 22:00	ND	ND	31	29	58	44	41	33	0.4	5	28	51.6	42.1	0	0.00
10/16/2018 23:00	ND	ND	28	30	57	43	39	32	2.0	295	20	51.3	44.2	0	0.00
10/17/2018 0:00	ND	ND	29	30	66	43	41	29	0.4	314	5	50.7	46.1	0	0.00
10/17/2018 1:00	ND	ND	27	29	55	44	40	31	0.4	331	18	50.1	46.6	0	0.00
10/17/2018 2:00	ND	ND	26	29	64	43	38	30	0.6	301	12	48.9	48.9	0	0.00
10/17/2018 6:00	ND	ND	30	27	52	42	41	45	0.1	282	14	42.3	64.1	0	0.00
10/17/2018 7:00	ND	ND	30	26	ND	38	39	60	0.2	217	21	44.0	60.4	28	0.00
10/17/2018 8:00	ND	ND	80	30	ND	45	58	72	0.1	94	16	49.1	55.1	152	0.00
10/17/2018 9:00	ND	ND	82	44	132	84	94	67	1.7	124	31	50.3	53.7	290	0.00
10/17/2018 10:00	ND	ND	66	52	104	89	77	51	1.7	148	65	53.5	49.3	413	0.00
10/17/2018 11:00	ND	ND	88	51	148	83	92	77	1.9	176	61	57.4	44.6	493	0.00
10/17/2018 12:00	ND	ND	90	50	155	101	114	87	2.9	189	34	58.7	42.5	525	0.00
10/17/2018 13:00	ND	ND	66	68	118	100	92	73	3.5	207	28	60.2	39.5	507	0.00
10/17/2018 14:00	ND	ND	58	62	105	91	79	63	3.5	211	38	61.2	38.1	437	0.00
10/17/2018 15:00	ND	ND	51	57	ND	83	73	64	3.4	186	27	61.8	36.6	329	0.00
10/17/2018 16:00	ND	ND	59	66	ND	94	87	73	1.8	176	26	62.5	36.3	188	0.00
10/17/2018 17:00	ND	ND	59	65	ND	87	81	63	2.1	246	48	58.9	41.4	36	0.00
10/17/2018 18:00	ND	ND	38	46	ND	68	56	54	2.0	303	9	55.9	42.9	1	0.00
10/17/2018 19:00	ND	ND	27	28	ND	43	36	37	2.2	307	4	55.4	41.2	0	0.00
10/17/2018 20:00	ND	ND	26	30	ND	47	38	31	2.2	324	10	55.2	40.9	0	0.00
10/17/2018 21:00	ND	ND	30	32	ND	49	43	32	2.5	307	32	55.1	41.0	0	0.00
10/17/2018 22:00	ND	ND	33	36	ND	55	47	34	0.7	299	69	53.4	43.7	0	0.00
10/17/2018 23:00	ND	ND	45	47	ND	64	60	37	0.6	13	23	52.2	45.1	0	0.00
10/18/2018 0:00	ND	ND	43	45	ND	64	58	44	0.5	20	18	51.2	47.7	0	0.00
10/18/2018 1:00	ND	ND	43	45	ND	63	61	46	0.1	28	36	49.1	52.6	0	0.00
10/18/2018 2:00	ND	ND	42	44	ND	63	56	40	0.8	294	52	48.8	53.6	0	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m³)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	WS	WD	Sigma	TEMP	RH	SOLAR	PCP								
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m²	inches
10/18/2018 6:00	ND	ND	38	38	ND	59	59	45	1.6	27	29	45.6	61.1	0	0.00
10/18/2018 7:00	ND	ND	38	39	ND	55	53	44	1.6	47	40	46.4	60.6	28	0.00
10/18/2018 8:00	ND	ND	42	38	62	54	56	41	1.3	109	12	50.7	54.8	193	0.00
10/18/2018 9:00	ND	ND	45	40	83	57	56	47	1.8	132	27	51.3	55.4	226	0.00
10/18/2018 10:00	ND	ND	55	43	102	63	70	59	1.8	127	43	50.9	57.6	356	0.00
10/18/2018 11:00	ND	ND	53	55	94	78	75	61	2.7	170	42	55.2	49.9	493	0.00
10/18/2018 12:00	ND	ND	58	64	104	90	79	62	2.9	210	25	55.8	49.1	436	0.00
10/18/2018 13:00	ND	ND	50	52	84	76	67	51	3.2	212	31	57.4	44.5	388	0.00
10/18/2018 14:00	ND	ND	38	41	70	60	53	42	3.2	209	33	58.2	41.5	376	0.00
10/18/2018 15:00	ND	ND	37	39	65	55	48	43	3.8	216	27	59.4	39.4	308	0.00
10/18/2018 16:00	ND	ND	39	38	71	60	50	50	3.1	219	31	59.9	38.1	177	0.00
10/18/2018 17:00	ND	ND	37	38	69	55	50	44	1.1	278	47	57.0	41.7	30	0.00
10/18/2018 18:00	ND	ND	32	38	64	56	49	38	0.8	318	21	54.1	46.6	0	0.00
10/18/2018 19:00	ND	ND	35	39	68	60	53	40	0.5	311	10	53.1	49.8	0	0.00
10/18/2018 20:00	ND	ND	37	40	68	58	54	41	1.6	304	9	53.4	48.7	0	0.00
10/18/2018 21:00	ND	ND	38	41	72	63	56	44	0.5	305	11	52.4	50.3	0	0.00
10/18/2018 22:00	ND	ND	44	46	75	67	62	43	0.3	353	15	51.0	53.2	0	0.00
10/18/2018 23:00	ND	ND	40	47	73	67	62	41	0.6	350	19	51.1	52.7	0	0.00
10/19/2018 0:00	ND	ND	39	43	77	63	59	41	0.3	327	17	49.5	55.9	0	0.00
10/19/2018 1:00	ND	ND	39	44	75	63	60	40	0.2	333	16	49.5	56.2	0	0.00
10/19/2018 2:00	ND	ND	39	43	75	63	57	42	0.2	326	6	48.7	57.7	0	0.00
10/19/2018 6:00	ND	ND	42	46	74	62	67	43	0.1	14	20	43.5	71.7	0	0.00
10/19/2018 7:00	ND	ND	44	45	78	67	69	48	0.4	353	55	46.0	65.3	22	0.00
10/19/2018 8:00	ND	ND	44	48	80	69	74	54	1.0	16	74	47.9	63.5	145	0.00
10/19/2018 9:00	ND	ND	52	49	97	73	71	54	1.5	111	15	52.8	55.0	281	0.00
10/19/2018 10:00	ND	ND	55	51	102	82	73	65	2.4	127	24	54.5	53.6	365	0.00
10/19/2018 11:00	ND	ND	74	68	128	97	91	83	2.8	189	53	56.2	51.9	447	0.00
10/19/2018 12:00	ND	ND	85	86	153	126	115	96	2.5	183	45	58.7	48.2	506	0.00
10/19/2018 13:00	ND	ND	74	79	122	111	100	75	2.8	163	40	60.4	44.1	485	0.00
10/19/2018 14:00	ND	ND	62	67	112	90	91	68	3.1	206	34	61.5	42.7	416	0.00
10/19/2018 15:00	ND	ND	58	66	105	90	82	66	3.3	197	38	62.1	41.0	308	0.00
10/19/2018 16:00	ND	ND	46	51	77	70	64	53	2.9	182	25	61.8	38.6	176	0.00
10/19/2018 17:00	ND	ND	37	41	64	54	49	39	1.1	232	46	59.0	40.4	30	0.00
10/19/2018 18:00	ND	ND	34	38	71	63	50	38	0.3	332	8	55.4	44.8	1	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m³)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	WS	WD	Sigma	TEMP	RH	SOLAR	PCP								
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m²	inches
10/19/2018 19:00	ND	ND	37	38	72	56	51	39	0.8	347	9	55.5	44.3	0	0.00
10/19/2018 20:00	ND	ND	37	39	74	58	54	41	0.5	338	9	55.0	44.9	0	0.00
10/19/2018 21:00	ND	ND	39	39	68	55	53	40	1.3	359	15	54.8	44.4	0	0.00
10/19/2018 22:00	ND	ND	36	35	62	49	46	35	1.7	20	10	55.3	41.9	0	0.00
10/19/2018 23:00	ND	ND	33	32	57	47	46	33	1.0	8	19	54.2	43.7	0	0.00
10/20/2018 0:00	ND	ND	41	37	63	56	24	35	0.4	11	12	52.2	47.9	0	0.00
10/20/2018 1:00	ND	ND	40	36	68	57	ND	38	0.2	4	22	52.1	49.2	0	0.00
10/20/2018 2:00	ND	ND	38	38	70	9	ND	40	0.0	307	6	49.4	54.9	0	0.00
10/22/2018 6:00	ND	ND	31	30	72	ND	ND	38	1.3	284	14	45.6	59.5	0	0.00
10/22/2018 7:00	ND	ND	35	33	70	53	18	44	0.9	274	20	44.9	61.8	16	0.00
10/22/2018 8:00	ND	ND	38	37	66	66	51	45	0.6	152	64	48.8	57.0	131	0.00
10/22/2018 9:00	ND	ND	44	43	70	76	51	40	0.8	95	27	52.0	53.7	269	0.00
10/22/2018 10:00	ND	ND	39	41	60	64	ND	37	2.0	125	32	55.4	49.4	386	0.00
10/22/2018 11:00	ND	ND	37	39	58	58	ND	35	1.9	126	50	59.3	43.7	466	0.00
10/22/2018 12:00	ND	ND	38	31	61	51	53	34	3.6	116	47	62.3	35.7	491	0.00
10/22/2018 13:00	ND	ND	33	32	60	45	23	34	3.7	122	69	62.9	35.0	470	0.00
10/22/2018 14:00	ND	ND	31	36	53	62	34	37	3.5	214	33	63.1	37.5	404	0.00
10/22/2018 15:00	ND	ND	30	37	51	55	41	33	3.1	220	24	63.7	34.8	300	0.00
10/22/2018 16:00	ND	ND	29	33	48	45	ND	35	1.6	220	25	64.4	33.6	161	0.00
10/22/2018 17:00	ND	ND	32	36	52	48	ND	33	0.4	248	37	60.0	39.4	22	0.00
10/22/2018 18:00	ND	ND	37	39	67	79	ND	36	0.3	354	27	57.7	37.2	0	0.00
10/22/2018 19:00	ND	ND	36	38	64	59	ND	40	2.2	285	25	58.8	36.4	0	0.00
10/22/2018 20:00	ND	ND	37	39	62	54	ND	43	1.3	292	14	57.9	36.7	0	0.00
10/22/2018 21:00	ND	ND	37	39	73	56	ND	44	1.8	297	16	57.7	36.7	0	0.00
10/22/2018 22:00	ND	ND	36	42	66	56	ND	39	0.5	310	20	57.0	36.0	0	0.00
10/22/2018 23:00	ND	ND	39	44	71	61	38	42	0.3	301	32	55.1	38.9	0	0.00
10/23/2018 0:00	ND	ND	46	47	73	69	60	43	1.1	290	15	53.9	42.5	0	0.00
10/23/2018 1:00	ND	ND	44	43	75	64	52	50	1.0	292	28	52.8	43.9	0	0.00
10/23/2018 2:00	ND	ND	51	44	68	71	57	49	1.8	270	22	48.9	52.4	0	0.00
10/23/2018 6:00	ND	ND	35	37	48	61	62	47	0.9	308	33	45.7	59.0	0	0.00
10/23/2018 7:00	ND	ND	36	34	ND	51	53	42	0.6	269	30	45.0	59.8	10	0.00
10/23/2018 8:00	ND	ND	43	43	ND	76	49	48	1.6	257	42	48.8	54.3	100	0.00
10/23/2018 9:00	ND	ND	57	41	ND	75	53	43	1.0	190	71	50.6	54.8	241	0.00
10/23/2018 10:00	ND	ND	49	49	ND	85	51	59	2.3	118	32	55.4	47.6	369	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES (µg/m ³)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	WS	WD	Sigma	TEMP	RH	SOLAR	PCP								
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	mph	deg	deg	°F	%	w/m ²	inches
10/23/2018 11:00	ND	ND	66	45	ND	80	76	103	3.9	138	38	58.2	42.5	452	0.00
10/23/2018 12:00	ND	ND	47	45	ND	72	44	51	2.9	172	56	58.1	46.1	324	0.00
10/23/2018 13:00	ND	ND	45	39	ND	62	44	49	2.9	143	38	60.6	40.8	399	0.00
10/23/2018 14:00	ND	ND	44	56	ND	87	63	49	2.6	211	36	60.0	42.9	255	0.00
10/23/2018 15:00	ND	ND	50	52	ND	83	62	51	0.5	265	57	58.3	44.9	73	0.00
10/23/2018 16:00	ND	ND	46	45	ND	65	61	97	0.1	67	47	58.0	47.1	29	0.00
10/23/2018 17:00	ND	ND	53	59	ND	78	ND	47	0.5	4	56	56.6	49.2	5	0.00
10/23/2018 18:00	ND	ND	64	71	ND	90	ND	60	0.4	176	28	55.9	49.8	0	0.00
10/23/2018 19:00	ND	ND	59	67	ND	98	ND	66	0.8	216	46	54.3	56.8	0	0.00
10/23/2018 20:00	ND	ND	59	74	ND	110	ND	64	1.5	219	35	52.1	63.6	0	0.00
10/23/2018 21:00	ND	ND	59	73	ND	114	ND	66	0.8	270	34	50.3	67.2	0	0.00
10/23/2018 22:00	ND	ND	58	76	ND	111	ND	66	0.9	225	24	49.1	68.1	0	0.00
10/23/2018 23:00	ND	ND	64	84	ND	131	32	70	1.5	308	19	48.0	69.4	0	0.00
10/24/2018 0:00	ND	ND	83	122	ND	182	151	83	1.8	304	21	47.3	71.2	0	0.00
10/24/2018 1:00	ND	ND	95	133	ND	201	167	108	1.8	309	32	48.0	70.5	0	0.00
10/24/2018 2:00	ND	ND	100	140	ND	204	167	97	0.3	181	43	47.1	72.8	0	0.00
10/24/2018 6:00	ND	ND	103	114	ND	162	153	98	0.4	358	25	42.8	85.8	0	0.00
10/24/2018 7:00	ND	ND	102	108	158	150	151	102	2.4	24	61	42.2	86.7	9	0.00
10/24/2018 8:00	ND	ND	101	110	177	160	156	104	3.0	51	53	44.3	83.2	118	0.00
10/24/2018 9:00	ND	ND	100	105	176	159	146	104	4.0	106	55	45.4	81.1	170	0.00
10/24/2018 10:00	ND	ND	98	99	179	154	143	106	4.8	90	48	48.2	75.5	369	0.00
10/24/2018 11:00	ND	ND	89	89	166	137	114	98	3.6	109	61	51.8	67.5	451	0.00
10/24/2018 12:00	ND	ND	39	46	70	71	41	42	4.4	171	26	54.5	59.6	476	0.00
10/24/2018 13:00	ND	ND	18	22	30	40	18	18	4.5	185	31	54.8	54.1	345	0.00
10/24/2018 14:00	ND	ND	13	16	22	27	16	13	3.9	196	44	54.9	49.9	258	0.00
10/24/2018 15:00	ND	ND	9	13	19	21	17	12	3.0	201	43	54.8	47.2	204	0.00
10/24/2018 16:00	ND	ND	13	11	22	17	ND	16	4.9	182	25	54.4	49.2	145	0.00
10/24/2018 17:00	ND	ND	10	12	26	22	ND	12	0.8	257	58	51.3	54.6	22	0.00
10/24/2018 18:00	ND	ND	11	14	21	26	ND	13	1.5	320	18	49.4	57.8	0	0.00
10/24/2018 19:00	ND	ND	16	18	31	33	ND	16	1.4	311	20	47.7	63.0	0	0.00
10/24/2018 20:00	ND	ND	15	18	29	33	ND	18	1.4	316	49	47.1	66.2	0	0.00
10/24/2018 21:00	ND	ND	14	18	29	36	ND	16	1.6	333	33	46.4	68.4	0	0.00
10/24/2018 22:00	ND	ND	17	22	32	35	ND	18	1.0	306	30	45.6	72.2	0	0.00
10/24/2018 23:00	ND	ND	15	16	33	31	ND	19	1.5	293	31	45.9	70.9	0	0.00
10/25/2018 0:00	ND	ND	9	13	24	26	ND	14	0.2	288	28	46.3	68.8	0	0.00

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/25/2018 1:00	ND	ND	12	14	29	30	ND	14	0.4	265	17	45.6	72.8	0	0.00
10/25/2018 2:00	ND	ND	13	19	32	26	ND	15	0.2	266	17	44.9	78.0	0	0.00
10/25/2018 6:00	ND	ND	30	33	63	46	45	31	0.1	16	26	42.0	87.7	0	0.00
10/25/2018 7:00	ND	ND	27	28	52	38	40	27	2.5	342	49	41.6	89.0	3	0.00
10/25/2018 8:00	ND	ND	20	22	41	31	34	23	1.9	297	44	41.8	88.5	25	0.00
10/25/2018 9:00	ND	ND	21	22	38	31	31	23	3.1	26	43	42.9	85.6	104	0.00
10/25/2018 10:00	ND	ND	20	21	35	29	29	22	2.3	30	68	44.8	81.0	122	0.00
10/25/2018 11:00	ND	ND	22	21	37	33	33	23	3.1	34	61	45.1	80.6	130	0.00
10/25/2018 12:00	ND	ND	20	21	36	31	28	22	4.0	42	45	45.8	78.7	138	0.00
10/25/2018 13:00	ND	ND	21	22	38	32	29	23	3.2	24	45	47.7	74.5	108	0.01
10/25/2018 14:00	ND	ND	19	23	43	34	ND	21	2.5	8	53	46.7	82.8	76	0.02
10/25/2018 15:00	ND	ND	20	18	31	28	ND	18	2.7	35	57	46.8	80.5	39	0.02
10/25/2018 16:00	ND	ND	15	17	31	23	25	16	0.6	13	33	46.3	83.6	16	0.03
10/25/2018 17:00	ND	ND	20	21	34	29	29	19	1.5	37	82	45.1	90.1	3	0.05
10/25/2018 18:00	ND	ND	14	17	33	25	22	19	1.1	9	71	45.1	90.1	0	0.05
10/25/2018 19:00	ND	ND	16	22	38	31	27	20	0.8	108	73	45.3	91.0	0	0.05
10/25/2018 20:00	ND	ND	19	22	38	32	27	23	1.0	75	73	45.0	93.1	0	0.07
10/25/2018 21:00	ND	ND	15	13	30	24	ND	21	0.2	358	41	44.6	94.7	0	0.14
10/25/2018 22:00	ND	ND	13	50 F	23	19	ND	16	0.5	8	42	44.2	94.9	0	0.18
10/25/2018 23:00	ND	ND	12	203 F	22	20	ND	13	0.8	352	45	44.2	96.0	0	0.21
10/26/2018 0:00	ND	ND	15	298 F	30	27	ND	18	0.9	9	23	44.0	96.2	0	0.26
10/26/2018 1:00	ND	ND	13	320 F	25	99 F	ND	17	1.9	13	70	43.9	97.2	0	0.10
10/26/2018 2:00	ND	ND	4	263 F	10	75 F	ND	7	4.0	16	26	43.6	97.7	0	0.13
10/26/2018 6:00	ND	ND	2	94	7	10	ND	5	1.5	44	51	44.4	97.8	0	0.29
10/26/2018 7:00	ND	ND	ND	ND	ND	ND	ND	5	0.8	51	76	44.9	97.9	1	0.30
10/26/2018 8:00	ND	ND	ND	ND	ND	ND	ND	9	1.9	14	48	45.6	96.4	21	0.30
10/26/2018 9:00	ND	ND	ND	ND	ND	ND	ND	13	2.1	24	51	46.5	91.9	55	0.30
10/26/2018 10:00	ND	ND	ND	ND	ND	ND	ND	19	1.6	42	65	47.5	88.7	90	0.30
10/26/2018 11:00	ND	ND	ND	ND	ND	ND	ND	22	2.6	162	39	49.2	86.9	190	0.30
10/26/2018 12:00	ND	ND	ND	ND	ND	ND	ND	23	2.8	187	32	51.5	83.2	273	0.30
10/26/2018 13:00	ND	ND	3	11	ND	17	ND	19	2.4	203	36	53.7	83.0	262	0.30
10/26/2018 14:00	ND	ND	15	16	ND	25	ND	16	2.5	187	22	53.1	86.8	88	0.30
10/26/2018 15:00	ND	ND	13	18	ND	28	ND	16	1.5	207	33	53.0	88.8	51	0.30
10/26/2018 16:00	ND	ND	11	16	ND	23	ND	14	1.4	221	58	53.2	88.8	16	0.30

MIDNITE MINE SUPERFUND SITE HOURLY MONITORING DATA

DATE AND TIME (PST)	E-SAMPLER HOURLY AVERAGE TSP VALUES ($\mu\text{g}/\text{m}^3$)								HOURLY METEOROLOGICAL DATA VALUES						
									WD						DAILY
	ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8	WS mph	WD deg	Sigma deg	TEMP °F	RH %	SOLAR w/m ²	PCP inches
10/26/2018 17:00	ND	ND	15	20	ND	33	ND	16	2.5	257	51	53.0	89.8	5	0.30
10/26/2018 18:00	ND	ND	23	26	ND	44	ND	22	3.4	265	53	52.6	91.9	0	0.30
10/26/2018 19:00	ND	ND	23	28	ND	48	ND	25	3.6	263	38	52.2	91.5	0	0.30
10/26/2018 20:00	ND	ND	15	14	ND	27	ND	17	2.9	257	58	51.5	82.2	0	0.30
10/26/2018 21:00	ND	ND	8	8	ND	19	ND	8	2.0	271	42	51.0	68.3	0	0.30
10/26/2018 22:00	ND	ND	10	6	ND	14	ND	7	3.6	287	31	49.8	62.9	0	0.30
10/26/2018 23:00	ND	ND	6	7	ND	20	ND	7	3.2	283	34	49.5	60.8	0	0.30
10/27/2018 0:00	ND	ND	6	8	ND	20	ND	8	4.4	254	19	48.6	63.4	0	0.30
10/27/2018 1:00	ND	ND	7	5	ND	13	ND	6	3.2	248	29	47.7	64.4	0	0.00
10/27/2018 2:00	ND	ND	6	7	ND	8	ND	6	3.3	299	27	46.9	66.4	0	0.00
10/29/2018 6:00	ND	ND	7	117 F	ND	19	ND	6	1.3	287	27	36.7	95.3	0	0.00
10/29/2018 7:00	ND	ND	10	839 F	ND	303 F	ND	9	0.9	281	20	36.8	96.6	3	0.00
10/29/2018 8:00	ND	ND	11	1048 F	ND	1651 F	ND	11	1.2	239	39	37.0	96.9	22	0.00

APPENDIX C: ALARM EVENT DOCUMENTATION
QUARTER 4, 2018

MDINITE MINE TSP ALARM RECORD (Page 1 of 2)

Date: 2 October 2018

Alarm Start Time: 1906 hours

Prepared By: Jeff Logan

Organization: Stantec CQC

A. TSP Readings, in $\mu\text{g}/\text{m}^3$ for Alarming E-Samplers, ppb (enter N/A if sampler not alarming) – See Comments

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
NA	NA	NA	NA	281	NA	NA	NA

B. Meteorological Conditions at Time of Alarm

Wind Speed (mph)	Wind Dir. (degrees)	Temperature (°F)	Relative Humidity (%)	Solar Radiation (W/m ²)	Daily Precipitation (inches)
9.7	275	53	37	N/A	0.00

Was fog present? No

Was precipitation occurring? No

C. Describe Activity in Vicinity of Alarming Sampler(s) and Identify Remediation Area.

Note Whether Site was Visited, and if Photos and/or Video Clips were Taken.

During the night shift, the winds picked up and were strong (between 5-10 mph). The night shift superintendent said that this caused a “swirling” tornado like dust storm carrying dust from Stockpile 4 toward ES-5. Once the wind calmed down, the dust subsided, and the alarm stopped. This event appears to be caused by this increased wind and not normal construction operations.

D. Indicate Alarm Causes Below as Appropriate (Check Box)

On-Site Activities	Weather Conditions	Off-Site Activity	Malfunction
	X		

E. Describe Actions Requested of Construction Contractor, and Time Completed.

Water was added to Stockpile 4 as a precaution.

MIDNITE MINE TSP ALARM RECORD (Page 2 of 2)

F. Record of Alarm Notifications (Should be Made in Order Shown)

Name	Organization / Title	Notification Method	Time Notified
Jed Thompson	CQC Field Engineer	Email	1906
Don Chavez	Construction Superintendent	Email	1906

G. TSP Readings Following Actions, ppb (enter N/A if sampler was not alarming)

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

H. Evaluate Effectiveness of Response Actions (if not effective, state why)

Once the wind subsided, the alarm stopped.

I. Other Comments / Observations

This appears to be an isolated event caused by high winds in the area.

MDINITE MINE TSP ALARM RECORD (Page 1 of 2)

Date: 26 October 2018

Alarm Start Time: 0400 hours

Prepared By: Jed Thompson

Organization: Stantec

A. TSP Readings, in $\mu\text{g}/\text{m}^3$ for Alarming E-Samplers, ppb (enter N/A if sampler not alarming) – See Comments

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
NA	NA	NA	NA	NA	910	NA	NA

B. Meteorological Conditions at Time of Alarm

Wind Speed (mph)	Wind Dir. (degrees)	Temperature (°F)	Relative Humidity (%)	Solar Radiation (W/m ²)	Daily Precipitation (inches)
3.62	52	44	99	0	0.24

Was fog present? Unknown

Was precipitation occurring? Yes

C. Describe Activity in Vicinity of Alarming Sampler(s) and Identify Remediation Area. Note Whether Site was Visited, and if Photos and/or Video Clips were Taken.

Alarm occurred prior to start of shift. No activity was occurring near the alarming sampler.

D. Indicate Alarm Causes Below as Appropriate (Check Box)

On-Site Activities	Weather Conditions	Off-Site Activity	Malfunction
	X		

E. Describe Actions Requested of Construction Contractor, and Time Completed.

No actions were taken since the site was wet at the time of the alarm and a rain event was in progress at the time of the alarms. It was determined that the alarms were caused by regional weather issues. All monitors were turned off.

MIDNITE MINE TSP ALARM RECORD (Page 2 of 2)

F. Record of Alarm Notifications (Should be Made in Order Shown)

Name	Organization / Title	Notification Method	Time Notified
Jed Thompson	CQC Field Engineer	Email	0400
Don Chavez	Construction Superintendent	email	0400

G. TSP Readings Following Actions, ppb (enter N/A if sampler was not alarming)

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

H. Evaluate Effectiveness of Response Actions (if not effective, state why)

The alarms were turned off.

I. Other Comments / Observations

Since the Site was wet at the time of the alarm and a rain event was in progress, regional weather was determined to be the cause. The monitors were turned off.

MDINITE MINE TSP ALARM RECORD (Page 1 of 2)

Date: 29 Oct 2018

Alarm Start Time: 0621 hours

Prepared By: Jed Thompson

Organization: Stantec CQC

A. TSP Readings, in $\mu\text{g}/\text{m}^3$ for Alarming E-Samplers, ppb (enter N/A if sampler not alarming) – See Comments

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
NA	NA	NA	1185	NA	1940	NA	280

B. Meteorological Conditions at Time of Alarm

Wind Speed (mph)	Wind Dir. (degrees)	Temperature (°F)	Relative Humidity (%)	Solar Radiation (W/m ²)	Daily Precipitation (inches)
1.31	220	37	97	40	0

Was fog present? Yes

Was precipitation occurring? No

C. Describe Activity in Vicinity of Alarming Sampler(s) and Identify Remediation Area. Note Whether Site was Visited, and if Photos and/or Video Clips were Taken.

Alarms began before start of shift and across the site. Ground was wet from 0.43 inches of precipitation previous day

D. Indicate Alarm Causes Below as Appropriate (Check Box)

On-Site Activities	Weather Conditions	Off-Site Activity	Malfunction
	X		

E. Describe Actions Requested of Construction Contractor, and Time Completed.

No actions were taken since the site was wet at the time of the alarm and fog was present at the time of the alarms. It was determined that the alarms were caused by regional weather issues (fog). All monitors were turned off for the remainder of the day.

MIDNITE MINE TSP ALARM RECORD (Page 2 of 2)

F. Record of Alarm Notifications (Should be Made in Order Shown)

Name	Organization / Title	Notification Method	Time Notified
Jeff Logan	CQC Manager	Email	0625
Val Ehrendreich	CQAO	Email	0625
Don Chavez	Construction Superintendent	Text	0625

G. TSP Readings Following Actions, ppb (enter N/A if sampler was not alarming)

ES-1	ES-2	ES-3	ES-4	ES-5	ES-6	ES-7	ES-8
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

H. Evaluate Effectiveness of Response Actions (if not effective, state why)

The alarms were turned off.

I. Other Comments / Observations

Since the Site was wet at the time of the alarm and there was fog present, regional weather (fog) was determined to be the cause. The monitors were turned off.

APPENDIX D: MONTHLY WIND ROSES
QUARTER 4, 2018

Figure D-1. Monthly Wind Rose, DMC Midnite Mine Site, WA

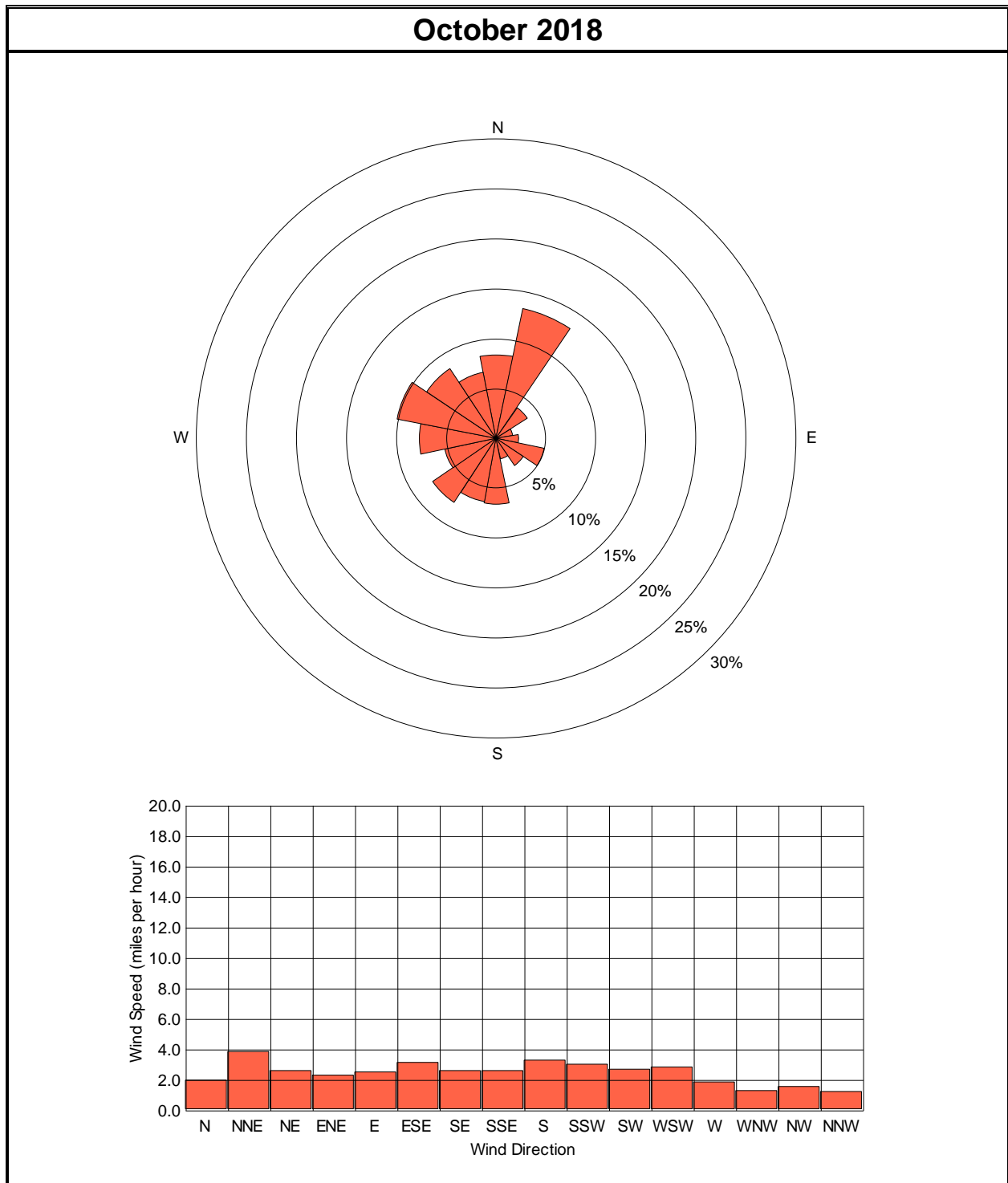


Table D-1. Monthly Wind Rose Summary, DMC Midnite Mine Site, WA

October 2018																		
Direction>>>		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (miles per hour)	0.1 - 2.0	5.4	3.2	1.7	0.7	1.1	1.5	1.2	0.7	1.9	1.2	2.6	1.9	5.2	8.7	6.6	5.4	48.9
	2.1 - 4.0	1.5	5.4	1.6	0.9	0.8	2.3	1.7	1.3	2.7	4.3	4.3	1.9	1.9	1.3	1.5	1.2	34.7
	4.1 - 6.0	1.2	2.2	0.3	0.1	0.4	1.2	0.4	0.1	1.5	0.8	0.5	1.2	0.1	0.0	0.0	0.1	10.2
	6.1 - 8.0	0.3	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.5	0.1	0.3	0.3	0.3	0.0	0.3	0.0	3.0
	8.1 - 10.0	0.0	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	1.2
	10.1 - 12.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4
	12.1 - 14.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	14.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20.1 - 22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22.1 - 24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	24.1 - 26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	26.1 - 28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28.1 - 30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	30.1 - 32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	32.1 - 34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	34.1 - 36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	36.1 - 38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38.1 - 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calm																		1.5
Total		8.3	13.2	3.8	1.7	2.3	5.0	3.4	2.2	6.6	6.5	7.7	5.2	7.7	10.1	8.3	6.7	100.0
Average Speed		2.0	3.9	2.6	2.3	2.5	3.2	2.6	2.6	3.3	3.0	2.7	2.9	1.9	1.3	1.5	1.2	2.4

Figure D-2. Monthly Wind Rose, DMC Midnite Mine Site, WA

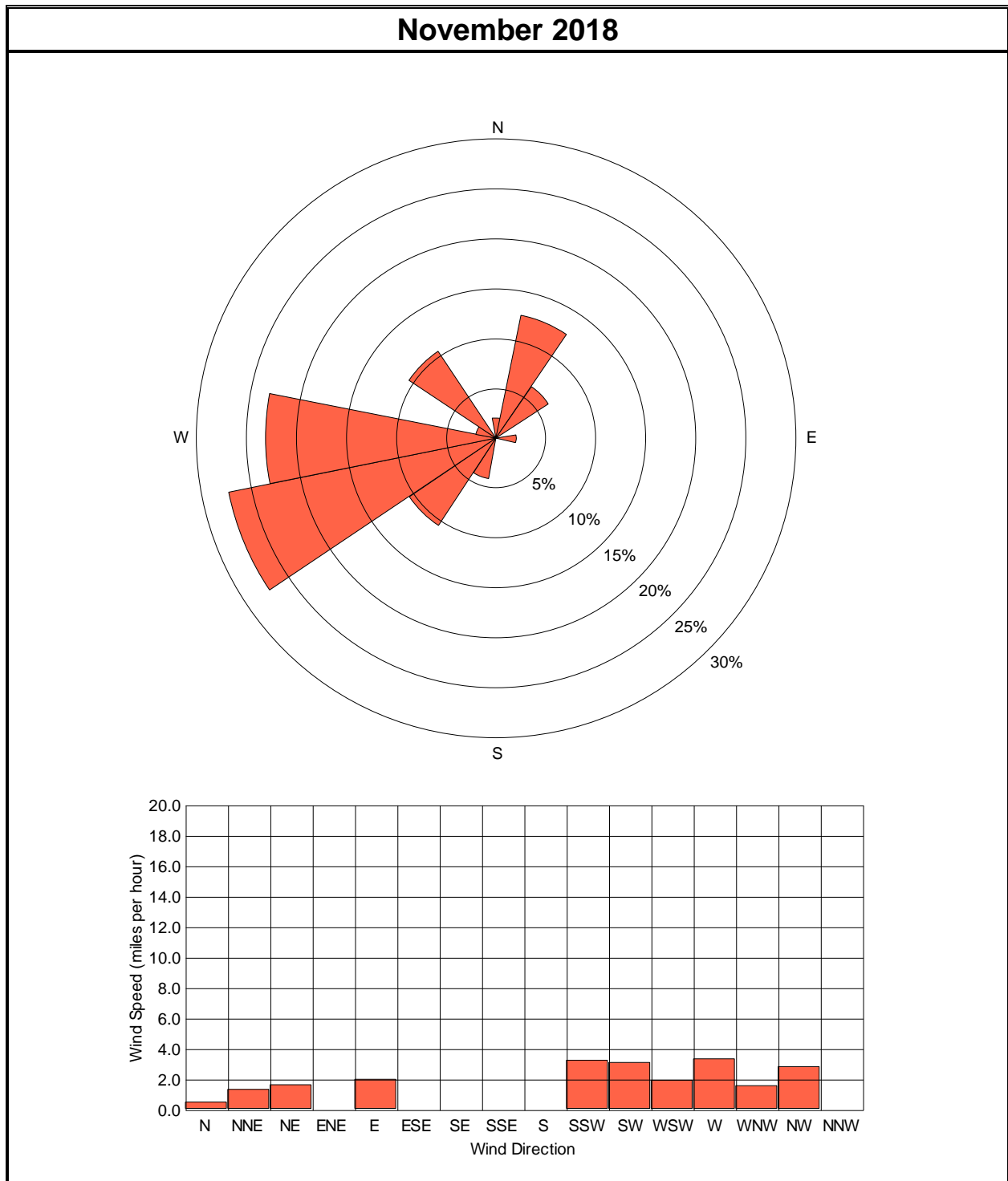


Table D-2. Monthly Wind Rose Summary, DMC Midnite Mine Site, WA

November 2018																		
Direction>>>		N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	Total
Wind Speed (miles per hour)	0.1 - 2.0	2.1	8.3	4.2	0.0	2.1	0.0	0.0	0.0	0.0	0.0	0.0	18.8	6.3	2.1	2.1	0.0	45.8
	2.1 - 4.0	0.0	4.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	4.2	8.3	2.1	8.3	0.0	6.3	0.0	35.4
	4.1 - 6.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.1	6.3	8.3	0.0	2.1	0.0	18.8
	6.1 - 8.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	8.1 - 10.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	10.1 - 12.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	12.1 - 14.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	14.1 - 16.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	16.1 - 18.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	18.1 - 20.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	20.1 - 22.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	22.1 - 24.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	24.1 - 26.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	26.1 - 28.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	28.1 - 30.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	30.1 - 32.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	32.1 - 34.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	34.1 - 36.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	36.1 - 38.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	38.1 - 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	> 40.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Calm																		0.0
Total		2.1	12.5	6.3	0.0	2.1	0.0	0.0	0.0	0.0	4.2	10.4	27.1	22.9	2.1	10.4	0.0	100.0
Average Speed		0.5	1.3	1.6	---	2.0	---	---	---	---	3.3	3.1	1.9	3.4	1.6	2.8	---	2.4

APPENDIX E: E-SAMPLER CALIBRATIONS
QUARTER 4, 2018

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1551-1608 **MST**
SAMPLER S/N: ES-2 (11510)
RADIO NO.: N/A
TSP CAL FACTOR: 8.05
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR 0 min CORRECTED? N

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 21.2 TETRA CAL (Tf) 21.6
Difference = (Sampler Ind. - Tf) -0.4 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 91788 Pa
x 0.007501 = SAMPLER 688.5 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = 35.5 mmHg
Pass Fail X

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.06
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -2.9 %
Pass x Fail

COMMENTS: Adjusted pressure to 653.0 mmHg (87055 Pa)
Adjusted flow to 1.96 LPM

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1517-1527 **MST**
SAMPLER S/N: ES-3 (U11511)
RADIO NO.: N/A
TSP CAL FACTOR: 4.92
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR 0 min CORRECTED? N

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.1 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 20.7 TETRA CAL (Tf) 21.6
Difference = (Sampler Ind. - Tf) -0.9 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86889 Pa
x 0.007501 = SAMPLER 651.8 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = -1.2 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.09
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -4.3 %
Pass Fail X

COMMENTS: Adjusted flow to 2.01 LPM
Pump is noisy, needs replacement

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1459-1516 **MST**
SAMPLER S/N: ES-5 (U11838)
RADIO NO.: N/A
TSP CAL FACTOR: 8.05
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR 0 min CORRECTED? N

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 21.8 TETRA CAL (Tf) 21.2
Difference = (Sampler Ind. - Tf) 0.6 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 87003 Pa
x 0.007501 = SAMPLER 652.6 mmHg
TETRA CAL 652.5 mmHg
Difference = (Sampler - Tetra Cal) = 0.1 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 1.99
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ 0.5 %
Pass X Fail

COMMENTS:

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1529-1537 **MST**
SAMPLER S/N: ES-6 (U11839)
RADIO NO.: N/A
TSP CAL FACTOR: 8.05
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR 0 min CORRECTED? N

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 20.7 TETRA CAL (Tf) 21.5
Difference = (Sampler Ind. - Tf) -0.8 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86860 Pa
x 0.007501 = SAMPLER 651.5 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = -1.5 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.03
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -1.5 %
Pass X Fail

COMMENTS:

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1538-1548 **MST**
SAMPLER S/N: ES-7 (U11837)
RADIO NO.: N/A
TSP CAL FACTOR: 4.92
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR +3 min CORRECTED? Y

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 20.9 TETRA CAL (Tf) 21.6
Difference = (Sampler Ind. - Tf) -0.7 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86868 Pa
x 0.007501 = SAMPLER 651.6 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = -1.4 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.06
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -2.9 %
Pass X Fail

COMMENTS: Adjusted flow to 2.00 LPM

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1629-1639 **MST**
SAMPLER S/N: ES-8 (U11835)
RADIO NO.: N/A
TSP CAL FACTOR: 4.92
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR -4h 15min **CORRECTED?** Y

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 **LPM**
Pass x **Fail**

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 21.3 **TETRA CAL (Tf)** 21.8
Difference = (Sampler Ind. - Tf) -0.5 °C
Pass X **Fail**

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86856 **Pa**
x 0.007501 = SAMPLER 651.5 **mmHg**
TETRA CAL 653.0 **mmHg**
Difference = (Sampler - Tetra Cal) = -1.5 **mmHg**
Pass X **Fail**

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 **TETRA CAL** 2.08
% Difference = 100 x (Sampler Ind.- Tetra Cal)/Tetra Cal) -3.8 %
Pass X **Fail**

COMMENTS: Adjusted flow to 2.00 LPM

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1610-1620 **MST**
SAMPLER S/N: ES-9 (U20007)
RADIO NO.: N/A
TSP CAL FACTOR: 4.92
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR + 2 min CORRECTED? Y

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 21.3 TETRA CAL (Tf) 21.7
Difference = (Sampler Ind. - Tf) -0.4 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86875 Pa
x 0.007501 = SAMPLER 651.6 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = -1.4 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.06
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -2.9 %
Pass X Fail

COMMENTS: Adjusted flow to 2.00 LPM

FILTERS? N/A

MET ONE E-SAMPLER CALIBRATION CHECKS

LOCATION: Bison Office
DATE/TIME: 12-17-2018 @ 1642-1650 **MST**
SAMPLER S/N: ES-10 (W15097)
RADIO NO.: N/A
TSP CAL FACTOR: 8.05
SELF-TEST FREQ / RH: 1 hr / 35%
PERFORMED BY: Mike Williamson
TETRA CAL S/N: 149645

TIME CHECK (MST)

SAMPLER T ERROR 0 min CORRECTED? Y

LEAK CHECK (LPM) (Allowable = ≤ 0.2 LPM)

SAMPLER 0.0 LPM
Pass x Fail

AMBIENT TEMP (°C) (Allowable error = $\leq \pm 2.0$ °C)

SAMPLER IND. 21.8 TETRA CAL (Tf) 21.7
Difference = (Sampler Ind. - Tf) 0.1 °C
Pass X Fail

BAROMETRIC PRESSURE (mmHg) (Allowable error = $\leq \pm 10$ mmHg)

SAMPLER 86875 Pa
x 0.007501 = SAMPLER 651.6 mmHg
TETRA CAL 653.0 mmHg
Difference = (Sampler - Tetra Cal) = -1.4 mmHg
Pass X Fail

FLOW RATE (LPM) (Allowable error = $\leq \pm 4.0\%$)

SAMPLER IND. 2.0 TETRA CAL 2.02
% Difference = $100 \times (\text{Sampler Ind.} - \text{Tetra Cal}) / \text{Tetra Cal}$ -1.0 %
Pass X Fail

COMMENTS:

FILTERS? N/A

APPENDIX F: METEOROLOGICAL CALIBRATIONS
QUARTER 4, 2018



BISON

ENGINEERING, INC.

Bison Engineering

Meteorological Parameters Calibration Form

Date: 11/20/2018 Start calibration at old site at 1105 PST
Client: Newmont - Midnite Mine Met Station moved to lower decon shack following audit
Site: Met Station (temporary for winter)
Performed By: Steve Heck Start data at new site at 1405 PST
Re-Checked rain gauge at new site and connected heater

Temperature

Site Sensor: Met One 083E-1-35, Serial No. U12338
Sensor Height: 2.5 meters
Reference Std.: Fan-Aspirated Psychrometer

Reference Value	Site Value	Diff.
°F	°F	°F
39.7	40.4	0.7

Wind Direction

Site Sensor: Met One 034B, Serial No. U12443
Sensor Height: 3 meters
Design Locked Orientation: 180 deg. true north
Orientation (GPS sighting): 180
GPS coordinates of wind vane:
Lat 47 deg 56.474 min N, Long 118 deg 05.733 min W
GPS coordinates of sighting point:
Lat 47 deg 56.486 min N, Long 118 deg 05.733 min W
Sensor reading in locked position: 180.4

Linearity Fixture: Met One degree wheel

Wind Direction Linearity Checks

Setpoint	Rdg.	Diff
0	0.4	0.4
30	30.6	0.6
60	59.8	-0.2
90	90.4	0.4
120	120.8	0.8
150	150.2	0.2
180	180.7	0.7
210	210.8	0.8
240	240.3	0.3
270	270.8	0.8
300	300.6	0.6
330	330.9	0.9

Max Diff 0.9

Wind Speed

Site Sensor: Met One 034B, Serial No. U12443
Sensor Height: 3 meters
Reference Std: Met One 300 rpm & 600 rpm synchronous motors

Synchronous motor checks

Known Value	Known Value	DAS Value	DAS Diff.
RPM	mph	mph	mph
0	0.00	0.00	0.00
300	18.49	18.50	0.01
600	36.38	36.37	-0.01

Relative Humidity

Site Sensor: Met One 083-1-35, Serial No. U12338
Sensor Height: 2.5 meters
Reference Std.: Assmann Psychrometer

BP = 27.12 in. Hg

Ref Dry-Bulb:	4.3	deg C
Ref Wet-Bulb	1.1	deg C
Ref RH:	56.7	%RH
Station RH:	57.5	%RH
Diff:	0.8	%RH

Precipitation

Site Sensor: Met One Model 375, S/N U13846
Sensor Height: ~0.5 meters

559 ml water added to 8-inch opening, 0.01 inches of precipitation per tip
Calibration is 8.24 ml per tip
Known value is $559 / 8.24 = 67.8$ tips (so 67 full tips expected)

Unit registered 62 tips at old site
% difference from expected = -7.5%

Unit registered 61 tips at new site
% difference from expected = -9.0%

Solar Radiation

Time (PST)	Audit SR W/m2	Site SR W/m2	Diff. %
1157	385	371	-3.8
1202	382	376	-1.6
1204	381	375	-1.6